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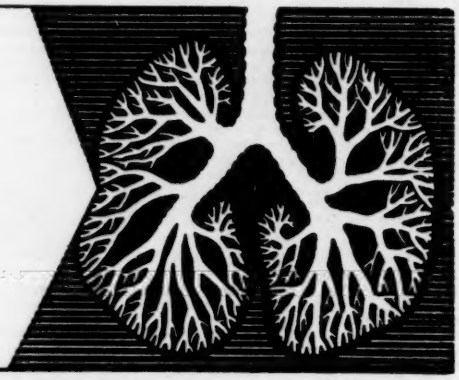

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

A Surmise on Some Trends in Bacteriology
Prof. E. G. D. MURRAY, L.M.S.S.A. 221

Phenylbutazone Therapy
ENA BRUCK, M.B.
M. E. FEARNLEY, M.R.C.P.
I. MEANOCK, M.R.C.P.
H. PATLEY, M.D. 225

Surgical Management of Gastro-duodenal Hæmorrhage
GORDON FERGUSON, F.R.C.S. 228

Influence of Protein Metabolism on Bacterial Allergy
D. A. LONG, M.D. 231

Screening Test for Excessive Urinary Copper
C. J. EARL, M.R.C.P. 234

Glucagon and Glycogen-storage Disease of the Liver
DOUGLAS HUBBLE, M.R.C.P. ... 235

Preservation of Corneal Grafts by Freezing
H. H. G. EASTCOTT, F.R.C.S.
A. G. CROSS, F.R.C.S.
A. G. LEIGH, F.R.C.S.
D. P. NORTH, M.B. 237

Gangrene of the Leg Following Carbon-monoxide Asphyxia
P. B. S. FOWLER, M.R.C.P. 240

SPECIAL ARTICLES

Control of Cancer Mortality
Prof. N. E. MCKINNON, M.B. 251

Qualifications of Medical Auxiliaries 255

RECONSTRUCTION

Central Surgery for a Partnership 255

MANAGEMENT OF BURNS

V. Treatment of the Neglected Burn 257

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents 261

LEADING ARTICLES

CORNEAL GRAFTING 243

NON-TUBERCULOUS TUBERCULIN REACTIONS 244

MUSCULAR DYSTROPHY 246

ANNOTATIONS

Message to Congress 247
Diagnosis of Amœbiasis 247
The Temporal-lobe Epilepsies 248
Diabetic Hepatomegaly 248
Surgical Treatment of Angina Pectoris 249
Comparative Psychiatry 250
Promotion of Group Practice 250
THE LANCET Air-mail Edition 250

LETTERS TO THE EDITOR

Lente Insulin (Dr. Wilfrid Oakley) 262

Centrifugally Travelling Non-thrombotic Phlebitis (Sir Henry Tidy, F.R.C.P.) 262

Salaries of Whole-time Specialists (Dr. William Morton) 263

Shoe Design and the Great Toe (Mr. J. F. H. Hinton) 263

Prescribing and Propaganda (Dr. Robert Ollerenshaw; Miss Dorothy Holland, S.R.N.) 263

Mephenesin in Rheumatism (Dr. John Ebbetts) 264

Freedom to Prescribe (Dr. G. E. Loxton) 264

Reactions to Penicillin (Dr. J. M. Battersby; Dr. M. H. Russell) 264

Urethral Apoplexy (Mr. C. Patrick Sames, F.R.C.S.) 265

The Simple Ganglion (Dr. Brian Webber) 265

The Recent Burn (Dr. S. Shubsachs) 265

Microbial Warfare (Dr. G. H. Lathe) 265

Corticotrophin and Cortisone in Dermatology (Dr. J. H. Laurie) 265

Sign of Ascites (Dr. H. M. Godin) 266

Hypnosis as a Dental Anæsthetic (Dr. Gordon Ambrose) 266

"Molluscum Pseudocarcinomatosum" (Dr. F. Parkes Weber) ... 266

Language of the Heart (Dr. Th. Olbert) 266

Histological Changes in Acrosclerosis (Dr. J. T. Ingram) 266

Certificates (Mr. G. F. Henderson, F.R.C.S.E.) 266

On Credulity (Dr. W. Pinnington Jenson) 267

REVIEWS

Notices of Books 241

PUBLIC HEALTH

District Nurses 259
London in 1953 259
Prevention of Food-poisoning in School Canteens 259
Missing Radium Found 260
England and Wales in 1953 260

PARLIAMENT

Clean Food Bill 260
Question Time 260

OBITUARY

Austin Edwin Cooper 267
William Henry Rowell 267
Allan Pledger Piggot 267
Herbert Leslie Milles 268

NOTES AND NEWS

Classification of Proprietary Medicines 269
Epidemic Hæmorrhagic Fever ... 269
Preventive Medicine and the Hospital 269
London School of Hygiene and Tropical Medicine 269
Erythromycin 269
Obstetric Analgesia 269
Sterility in Man 269

University of Birmingham 270
Medical Research Council 270

Diary of the Week 268
Appointments 270
Births, Marriages, and Deaths ... 268

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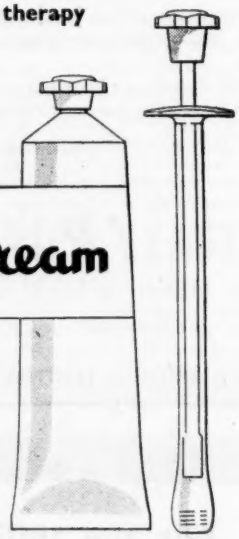

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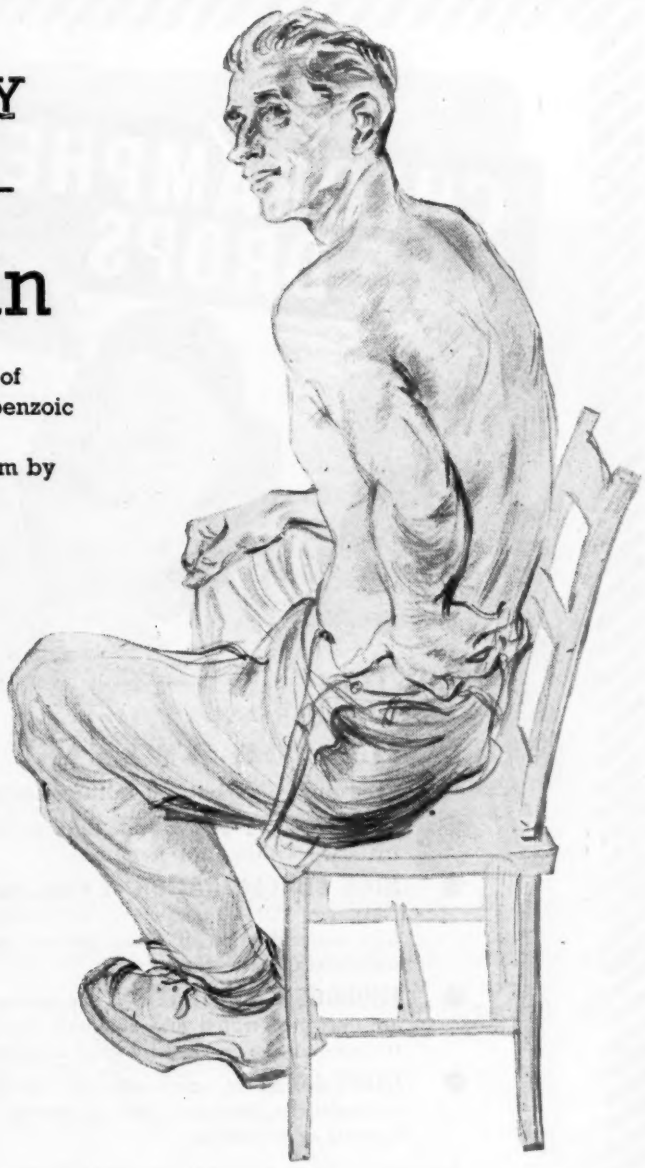

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Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
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p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

Transvasin is available in 1 oz. tubes at 3/4½ plus 7½d P.T., which are obtainable on form E.C.10, and is not advertised to the public.

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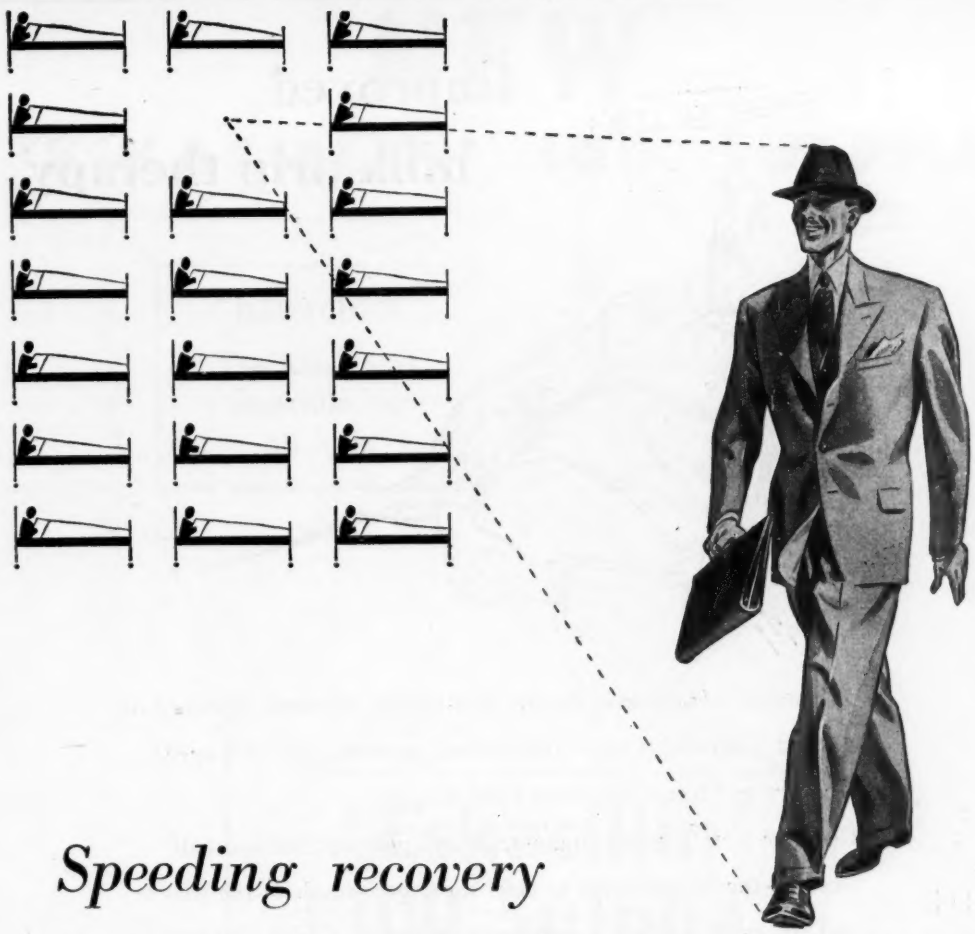

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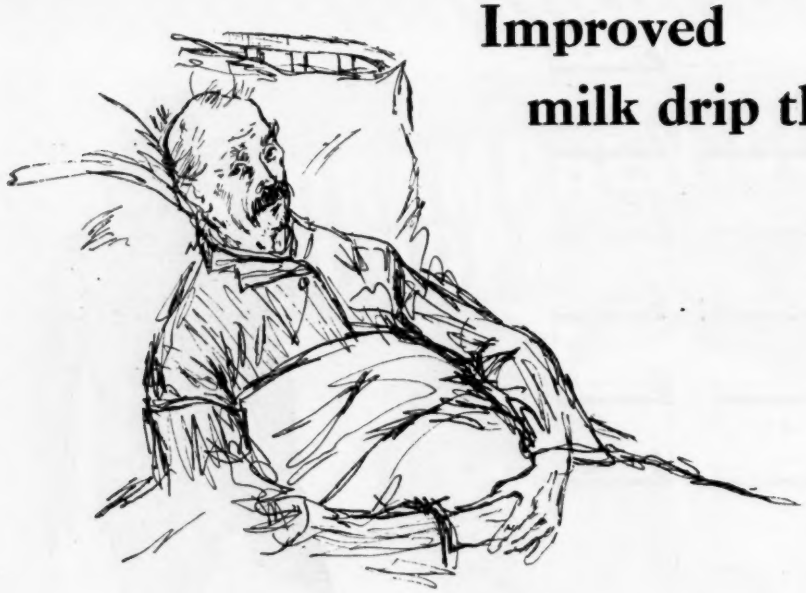

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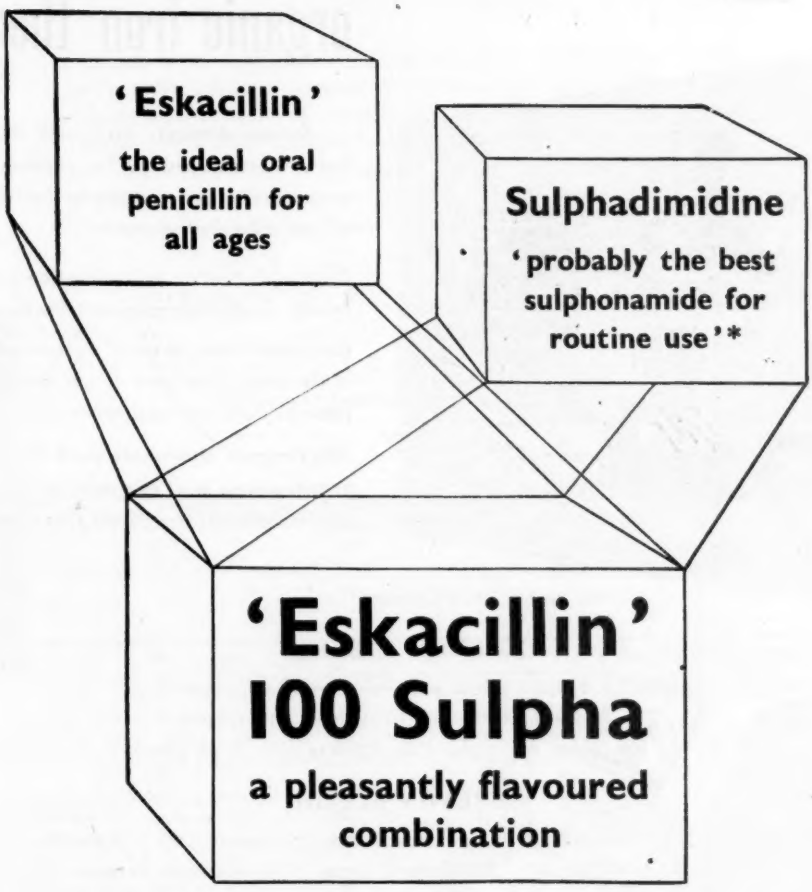

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Each standard medical teaspoonful (1 fl. dram : 3·5 ml.) contains 100,000 I.U. crystalline potassium penicillin G and 0·5 g. sulphadimidine.

*NATIONAL FORMULARY (1952) p. 33.

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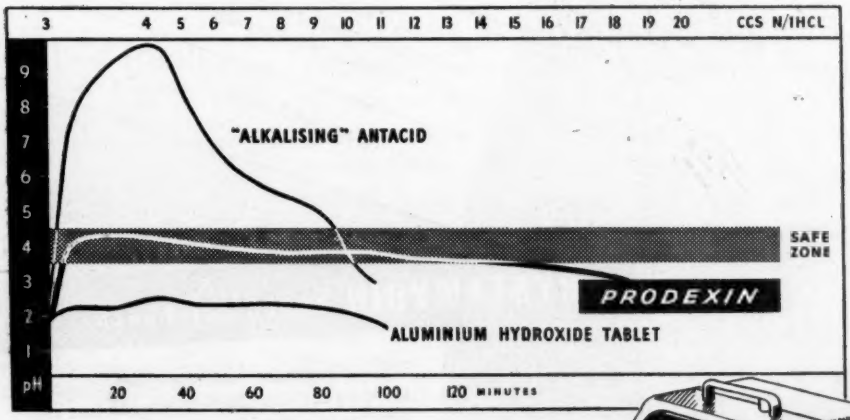
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9 8 7 6 5 4 3 2 1 pH
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SAFE ZONE
PRODEXIN
ALUMINIUM HYDROXIDE TABLET
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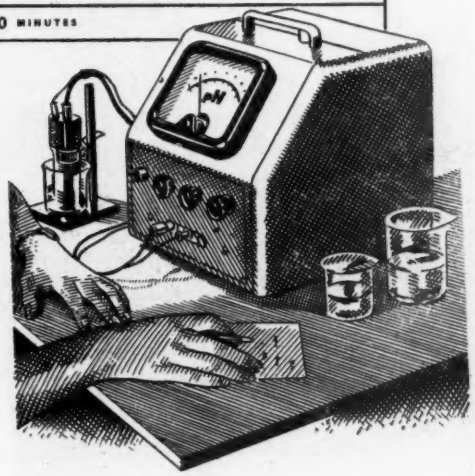

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Each tablet contains:—

Aluminium glycinate.....0·9 gramme.
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Light magnesium carbonate.....0·1 gramme.

The basic N.H.S. cost of treatment at the rate of 6 Prodexin tablets daily is 8½d.

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DIMYCIN Essential Facts

Description	Mixture of equal parts of streptomycin and dihydrostreptomycin, enabling dosage of each component to be half that usually employed.
Pharmacology	For all practical purposes streptomycin and dihydrostreptomycin have the same therapeutic activity. With prolonged dosage of either drug neurotoxic effects have occasionally been observed—their incidence depending largely on size of dosage and total amount given. Using a half dose of each antibiotic the full therapeutic effect can be obtained while any risk of neurotoxic effects is reduced.
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Packs	Vials: 1 gram and 5 grams

Good point this

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Description	" Broad spectrum " antibiotic preparation containing sodium penicillin, streptomycin sulphate and dihydrostreptomycin sulphate.
Range of Activity	Provides combined antibacterial activity of penicillin and streptomycin; highly effective against gram-positive and gram-negative organisms.
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Side Effects	By combining streptomycin and dihydrostreptomycin in one injection, dosage of each form is halved and risk of neurotoxicity from either antibiotic is thus reduced.
Packs	' Single dose ' vials containing 500,000 units sodium penicillin G, 0.25 gram streptomycin sulphate and 0.25 gram dihydrostreptomycin sulphate.

I'm finding it particularly effective in resistant infections too

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A CENTRALLY-ACTING VASORELAXANT WITH A POTENT HYPOTENSIVE ACTION

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Produce an immediate and pronounced reduction of blood-pressure and find valuable application in the treatment of acute episodes of hypertension, e.g. malignant hypertension, encephalopathy and eclampsia.

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a new

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longer acting than

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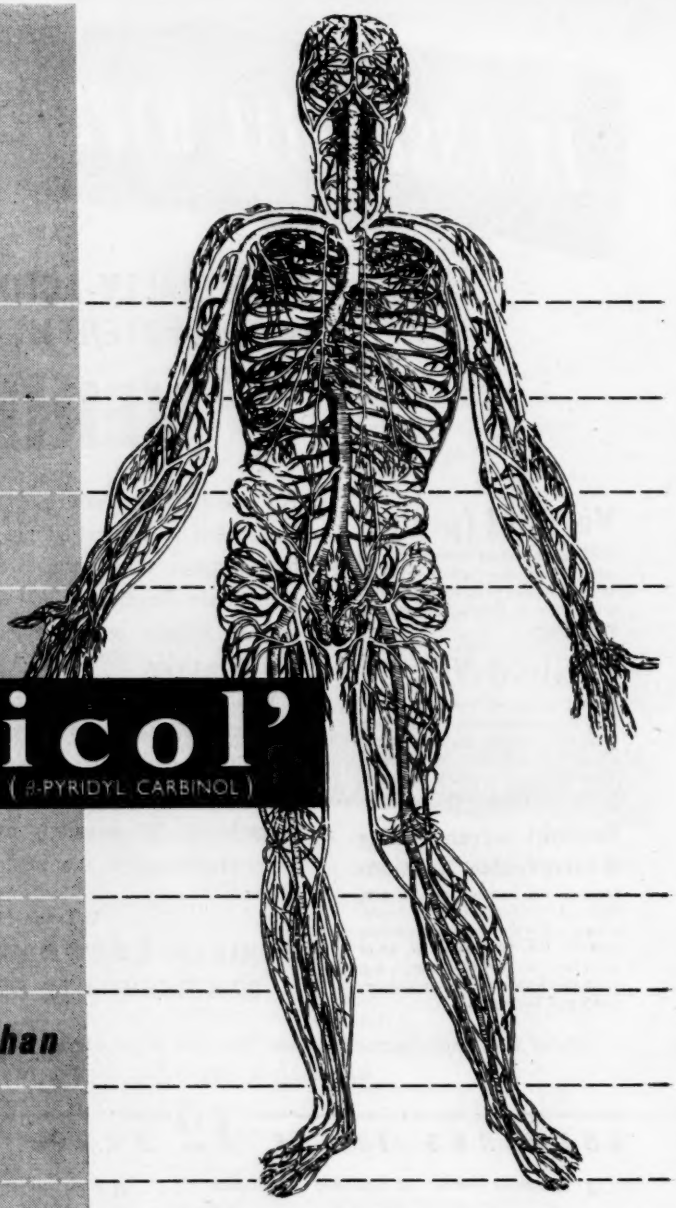
with fewer

side effects



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- NO SPECIAL REGIMEN NEEDED

'Antepar' BRAND **ELIXIR**

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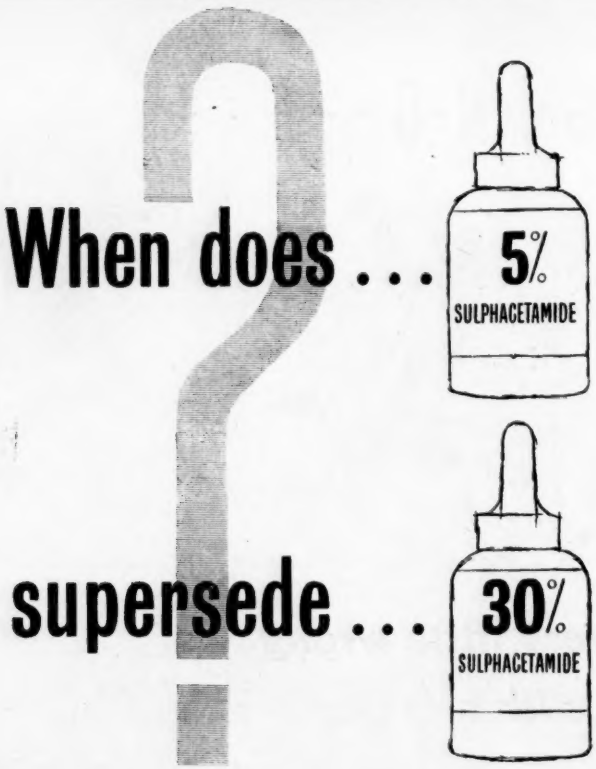

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Available in ½ fl. oz. Dropper Bottles at 3/- and 20 fl. oz. Dispensing Packs at 67/6d.

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BOOTS PURE DRUG COMPANY LIMITED NOTTINGHAM

S. 189

A SURMISE ON SOME TRENDS IN BACTERIOLOGY *

E. G. D. MURRAY
O.B.E., M.A. Camb., L.M.S.S.A., F.R.S.C.
PROFESSOR OF BACTERIOLOGY AND IMMUNOLOGY, MCGILL UNIVERSITY, MONTREAL

UNBOUNDED speculation may lead into that insidious state so aptly described as "wishful thinking," and the transition to this from justifiable theoretical hypothesis is a slip that is all too easily made. With this in mind, and without over-confidence in the security of age and experience, I have thought to peer into the fringing mists of the unknown, with the hope that one or two of the shapes seen might have substance enough to encourage investigation.

Until quite recently the difficulties and the seemingly merely academic importance of the minute structure of bacteria have induced most of us to be content with little more than the shape of the cells and their arrangement. The recognition that microscopically indistinguishable forms had widely different activities forced a differentiation of kinds on the basis of their physiology; and so, to a large extent, present bacterial taxonomy rests upon these observations. Practical applications and the urgency of rapid diagnosis have tended to restrict these examinations to relatively simple procedures, with only virtually exceptional interest in the manner of the processes involved.

But the wide importance and the astounding diversity of bacterial activities have stirred a tremendous development in pure bacteriology, and there are but few fields of human interest that have not been influenced by this subject.

The most intimately associated sciences are pathology, because of pathogenic species, and biochemistry, because of the selectiveness and ready availability of the infinite variety of functions which bacteria provide. The possibilities of expansion of bacteriology, pathology, and biochemistry in this way are very far from being exhausted. The development of essential concepts governing mutual progress in these branches of science is to be expected from the study of overlapping interests, but the impetus that any observation may inspire seems almost to depend on what is in fashion at the time. Sometimes the association of ideas through knowledge of pertinent observations is lost or delayed by the very vastness of scientific literature and the terminology of extreme specialisation. A single observation can impinge on several seemingly unrelated problems; for example, the cell-free extremely potent choline-acetylase which has been isolated from the non-pathogenic *Lactobacillus plantarum* may yet help in the fuller understanding of some problems in physiology, of the properties of botulinus toxin, and of the pathology of botulism.

Bacteriology has contributed extensively to enzymology, which has developed rapidly into what would amount to a new branch of science were it not concerned in all biology. Since enzymes seem to be the key to so many processes on which all forms of life depend, and since bacteria exist in and about our bodies in such large numbers, either as our friends or as our enemies, it is to be expected that bacterial enzymes may yet be shown to contribute to both our health and our illness, and that bacterial products may yet be found to be disastrous competitive substrates for our own enzymes. The importance of bacterial synthesis of vitamins is admitted, and the digestion of cellulose is being shown to be more a function of bacteria in the stomach and intestinal tract than of the host-secreted enzymes in herbivora; and there are indications that the elimination of parasitic symbiotic bacteria may contribute to ill health. Thus, quite apart from their toxins, bacteria evidently play an important rôle in human health and disease.

In yet another direction, because of the easily observed variation and mutation of bacteria, either natural or induced by ways of intrinsic interest, complemented by the rapidly succeeding generations in a culture with immense numerical advantages, bacteria are attracting more and more attention in genetics, with unpredictable promise. With the possibilities of maintaining control and of delicate appreciation there may be hope of gaining some understanding of the superlatively accurate reduplication and recombination of hereditable characters, as the study of the structure and function of the bacterial nucleus progresses. Contributing to this, as well as to the general knowledge of virology, much may be expected from the morphological and biochemical studies of the nucleus of bacteria infected with virulent and lysogenic bacteriophage.

* * *

Bacteriology applied to industry, sanitation, and agriculture is beyond my present range, except for one point that may prove worth attention. The aggregation effect of bacterial polysaccharides on the structure of the soil, requisite to its fertility, is so remarkable that unsuspected pathological influences of the capsule substance of pathogenic bacteria is not beyond the bounds of possibility. Up to now the capsule of pathogenic bacteria has only been associated with type-specific antigenicity and virulence by resistance to phagocytosis, besides rough and smooth variation and some part of the hyaluronic-acid story. It is pertinent that no defined toxin has been described for such examples as the pneumococcus, Friedländer's bacillus, and, depending on definition, *Bacillus anthracis*, though their pathogenicity is beyond question. But a well-developed capsule does not preclude a toxin, as witness *Clostridium perfringens*. The disease processes involved in many bacterial infections have not been adequately explained in detail, either for lack of finding a toxin in the accepted sense or by such toxins as have been found, and the mere presence of particulate bacterial bodies, in large or small numbers, localised or generalised, is not sufficient in itself, because of the differences in the manifestations of illness and the distinct and often characteristic nature of the lesions. It is no longer satisfactory merely to know that a particular disease is directly associated with a clearly recognised bacterial species.

* * *

Pathological changes may be brought about otherwise than by toxins; for example, the extensive monocytosis caused by *Listeria monocytogenes* is due to a non-toxic non-antigenic lipid which, when extracted from the bacterial cell by chloroform, produces its effect when injected into animals. Infection with this organism also causes necrosis, and no toxin has yet been found; but this may be a matter of conditions, as was the case with *Cl. perfringens* and *Staphylococcus pyogenes*.

The action of diphtheria toxin may explain the local œdema when culture is injected into a guineapig subcutaneously, but the œdema of a *Streptococcus pyogenes* phlegmon, and many another, is not at present to be explained even so vaguely as that. The massive œdema of natural infection in rabbits with *L. monocytogenes* is likewise unexplained, and the peculiar character of the serous exudate—so charged with visible triple-phosphate crystals that centrifuging 10–20 c.cm. yields

* A special university lecture in pathology given by invitation of the academic council and the senate of the University of London on Oct. 12, 1953.

enough for chemical analysis—is a clear indication that more than transudation is involved.

The cellular responses to the chemical fractions of the tubercle bacillus, and the part each fraction contributes to the formation of the lesion and to immunological reactions, illustrate the importance of non-toxic bacterial substances in pathology. The electrophoretic fractions of the anthrax exudate give such an indication too, though of a different nature. In addition, the involvement of interactions of polymeric-electrolyte systems is clearly suggested by the discovery that the anthrax bacillus secretes polyglutamic acid, which is counteracted in the body by a "tissue factor" which is seemingly closely related to polylysine. This introduces a new concept with unexplored pathological implications.

The variation in the form of a specific disease in different species of animals is a problem in pathology and is well illustrated by listeria infection. In cattle, sheep, goats, and swine this is predominantly a meningo-encephalitis but sometimes a metritis, with abortion; in birds there is a myocarditis, which is also frequent in guineapigs; in the fox and perhaps in the dog the illness is distemper-like; and in rabbits, guineapigs, horses, and hamsters there is a conjunctivo-keratitis, which is quite peculiar. In many but not all animals listeria produces a systemic infection marked by a necrotic hepatitis; but in the ferret it is a mild disease, almost a carrier state. Most strikingly, the monocytosis seen in many species of host does not occur in ruminants, although they are susceptible to fatal natural infection. The human disease has often been meningitis, sometimes septicæmia, and occasionally a typical infectious mononucleosis. A special form of human disease has been described in Germany and called "granulomatosis infantisepticum" and one such case was found in Canada. In some twenty-seven fatalities in newborn infants in Halle *L. monocytogenes* was isolated; the disease was a generalised infection with extensive liver necrosis, and an identical strain of the organism was isolated from the vagina of the mothers, who remained well. This resembles the epidemic form of the disease in rabbits, and listeria has been isolated from the vagina of several other kinds of animal.

Variations in host susceptibility and in the form and character of disease can be illustrated by reference to a number of different pathogenic bacteria, viruses, and fungi. It is essentially a problem in pathology rather than one of variation in the bacteria concerned, though in some instances, such as *Erysipelothrix rhusiopathiæ*, adaptation of the micro-organism to the species of host is important. This well-known situation has been neglected as a research problem, as has also that of variation in susceptibility of individuals within a species, which is perhaps best illustrated in man by meningococcus and maybe by poliomyelitis, though it is evident in many infections. It is curious that Webster's observation on breeding a race of mice resistant to *Salmonella typhimurium* which were also resistant to mercuric chloride, and vice versa, has not been followed up, other than my confirmation of it using meningococcus and mercuric chloride. It seems that resistance to disease is not entirely a question of immunity. Although variation in resistance and susceptibility was recognised in the very beginning of pathogenic bacteriology, little more has been done than to note instances somewhat incidentally.

It is my impression that pathology is contributing too little to knowledge of infections, and it may be due to the heritage of the morbid-anatomy and histology tradition. It seems to me that pathologists in North America have little interest or knowledge of bacteriology, and that hospital bacteriology there is relegated to PH.D.s and so-called technicians, who have no training in pathology and little if any appreciation of the clinical problems in disease. This is probably much less apparent in Britain, though it is likely that what is sought by the pathologist is still a formed lesion rather than a disturbance of function or deranged intracellular physiology.

Disease, even death, may not depend always on a necrotising or lethal toxin secreted by the invading bacteria, and there may be no visible lesion. After all, the well-defined toxin in botulism causes definite symptoms and a high mortality without visible lesions, and though in pneumococcus infections visible lesions are not wanting, the process of their production is not clear. The active substance need not be antigenic or toxic, as is evident in the monocytosis of listeria infection and in tuberculosis. But, if capsular polysaccharides of bacteria can profoundly modify the "environment" within the tissues, as they do in the soil, some important new principle in pathology may emerge, with a new assessment of antigenicity and toxicity. Perhaps other products of bacteria, more difficult to appreciate, can take the place of the essential substances in the metabolism of the host cells, with consequent serious derangement of physiology. This is not wildly improbable, since it is more than a suspicion now that breakdown products of antibiotics can take the place of amino-acids in the metabolism of the bacterial cell, and in some instances this may eventually explain the action of certain antibiotics.

* * *

Bacterial antagonisms are not a new observation and are probably of great ecological importance in regional bacteriology and may operate by the products of one species acting as substitutes in the metabolism of another species. A dramatic instance of antagonism between pathogenic bacteria has frequently been observed in the complete replacement of meningococcus by pneumococcus in cases of meningitis; but how it comes about is a mystery insufficiently explained by mere recognition of pneumococcus antagonism and meningococcus catalase.

Synergy and antagonism between different species of bacteria present many interesting problems; and though the study of pure cultures of bacteria has yielded great stores of knowledge it may have clouded our view of what goes on in a mixed infection. Before the days of sulphonamides and antibiotics I have seen many cases in which control of the streptococcus in a mixed infection of a wound was impossible until the staphylococcus was dealt with adequately; on more than one occasion positive blood-cultures of *Strep. pyogenes* became negative as soon as the staphylococcus in the infected wound was suppressed. This is sometimes quite as well marked with proteus as the secondary organism. It has been shown that a susceptible strain of streptococcus will grow with an excessive concentration of sulphonamide in the medium when staphylococcus is mixed with it, and I have seen clear instances of this effect in the treatment of cases with sulphonamides. Mixed infections should not be regarded merely as an instance of two or more organisms existing independently in a lesion. Vincent's angina and swine influenza are clear indications of this, and I would even go so far as to suggest the reinvestigation of scarlet fever with this in mind.

* * *

Part of this question of environment is the disturbance of regional ecology by the use of antibiotics. The finding of known bacteria in unusual places, such as *Escherichia coli* in the nasopharynx and proteus in large numbers in the stools, is not necessarily merely resistance to the antibiotic but is as likely due to the profound change in the environment by the disappearance of expected kinds from accustomed places. I have suggested

to clinical colleagues that their indiscriminate use of antibiotics, causing displaced bacterial populations, may yet so confuse the patient that he will not know which end to put his hat on. We can as yet do little more than suspect disadvantages resulting from the disturbance of synergistic, symbiotic, and antagonistic associations. The preponderance of proteus in the gut of turkey poults treated with antibiotics has been shown numerically and associated with the disappearance of enterococci from the gut, which was supported by the antagonism demonstrable between these organisms in culture.

Attempts to reduce the bacteria in the human bowel by the preoperative use of antibiotics commonly produce more bacteria per gramme of fæces than there were to start with, though there is variable diminution followed by variable development of resistant forms of some accustomed intestinal kinds. With some antibiotics the altered environment seems to predispose to unusual infections, such as mycosis due to *Candida albicans*, which have even proved serious. This may involve the intriguing possibilities of identified bacterial breakdown products of some antibiotics (chloramphenicol) taking the place of amino-acids in the synthesis of bacterial proteins and of antibiotics competing with natural substrates in bacterial enzyme systems. It has been observed that even susceptible strains of *E. coli* can degrade chloramphenicol, and that certain of the identifiable products (such as *p*-nitrobenzaldehyde) greatly stimulate the growth of the same strain in culture as well as reverse the inhibitory action of the intact antibiotic.

The whole question may yet prove to involve vital processes not yet appreciated. The function of an antibiotic in the cell of its origin is still unknown, and what is involved in susceptibility and resistance to antibiotics is at present little more than conjecture. We do not know the physiological processes that make spirochætes, other than leptospira, susceptible to penicillin, or what these have in common with other susceptible bacteria. Penicillinase does not furnish sufficient explanation of resistance, because comparable contrasts and similarities are found for any other antibiotic. Further, the question of augmentation or of inhibition of one antibiotic by another requires explanation.

* * *

Environment is evidently of such significance that I find myself disturbed by the reliance we place on a culture medium, however abundant the growth of whatever micro-organism it may support. The exhibition and maintenance of virulence of the meningococcus tested in mice has a strict relation to the method of making the medium on which it is grown, and is independent of the amount of growth yielded. A serial sequence of cultures alternating on two selected media gives on the one constant virulence without change in the M.L.D. and on the other nearly complete lack of virulence, directly according to the medium on which the injected culture is grown. In this case it is not a question of mutation or of variation, but rather a physiological state of the meningococcus, which can deteriorate when grown on a medium wanting in special requisites for healthy development.

Pasteur was greatly intrigued by the inability of a culture to grow where it had grown before. His suggestion of exhaustion of the medium has been doubted, because another kind of bacterium may grow; but perhaps Pasteur was right. It has been shown that regrowth is supported when extremely minute amounts of selected trace elements are restored to the filtrate, and that these are essential to vital enzymatic production and activity. Such observations seem to me essential indications of a need for caution. But we should recognise, too, that in its natural state a bacterium is no doubt accustomed to fresh supplies and to removal of waste products, both of which we neglect. I cannot think of a worse slum than our test-tubes, in which we confine our cultures bathed in their own urine and fæces mixed with what may well be a bare subsistence diet. (Why should not bacteria suffer deficiency diseases just as much as we do?) Then we subject these slum children to exacting tests, supposing them to be athletes. It would be as sensible to enter a cab-horse in the Derby.

It has been found recently that there are bacteria in the soil which will only grow on media to which suitable extracts of soil are added. It is not merely a question of bacteria we cannot yet grow on culture, like leprosy, most of the borrelia, and some organisms in the mouth, among many others, but also it is the physiological activity of those we do grow that is important. Antigenic differences according to the medium as well as foreign antigens that cultures can take up, even hardy fellows like the typhoid bacillus, have been described. I have known marketed therapeutic antimeningococcus serum, made from cultures grown on Kutscher's placenta medium, to have a very high anti-human precipitin titre, even to give a heavy precipitate with human cerebrospinal fluid. These are not evidently permanent changes, and their character suggests something of either a suppressive or an additive modifying influence on antigenicity or specificity of a culture grown on a peculiar medium. This may be important to those placing great reliance on their determination of the exact antigenic make-up of the bacterial cell. It has not yet been shown that media constituents can deflect antigenic specificity in the manner of Landsteiner's conjugated antigens, but some surprising effects of varying the culture medium have been described without attracting much attention.

The "fixity of antigenic type" affords a working hypothesis that allows of useful applications in many bacteriological problems. But Griffith's transmission of a changed specific type in the pneumococcus, and Lederberg's apparent genetic transfer of a single strictly identifiable somatic antigenic character in salmonella, show that the tenet is not absolute. Even though it may prove to be a rare occurrence in nature and to depend on special circumstances, it nevertheless warns us of the need for great care in the selection of antigenic characters to be accepted as of taxonomic value. It seems to me obviously unsound to discard morphological, physiological, and pathogenicity characters and to place complete reliance on immunological differentiation of bacterial species, designing to merge useful and reasonably recognisable genera on the basis of a single common antigenic component. To appreciate the situation it is only necessary to consider what would happen to the classification of mammals if such weight were given to the specific antigenicity of the lens of the eye or of fibrinogen, or the Forsmann-like lipid antigens, and how many species of man would result from thus weighting the antigens of the erythrocyte alone.

The prevailing and ever-increasing confusion, arising out of the misapplication of the exceedingly sensitive immunological specificity of antigens, will eventually force a purposeful evaluation of antigens in the light of taxonomic significance. That day will not only be appreciated by the taxonomist but will also be hailed with joy in the diagnostic and public-health laboratories. Although the identification of antigenic components within a selected group of bacteria allows of an orderly arrangement, it has not yet given a satisfactory immunological definition of bacterial genera and species.

* * *

Despite the fact that there is still no real indication of actual crossing between bacterial cells in the form of conjugation, there is exciting evidence of what may be loosely called genetic exchange or transference. It may

well prove exceedingly difficult to recognise the circumstances of its occurrence in Nature, but the intricate conditions of effecting it experimentally, by selected bacteriophages and auxotrophic mutants induced by antibiotics, do not detract from its significance. Perhaps it is wrapped in the physiology of bacterial antagonisms involving substances now called antibiotics. It would not surprise me were it shown that substitutes of antibiotic origin combined in the bacterial cell could be displaced by the normal products of lysis of another cell of the same species, carrying with them transferable antigenic character transmissible to succeeding generations. Considering that a bacterium susceptible to chloramphenicol has been shown to degrade the antibiotic, and that the products of this greatly increase the growth in the culture, and, from another angle, bearing in mind the demonstrated natural death of a large proportion of cells in any young growing bacterial colony, I hold a strong though a properly restrained interest in this speculation.

Why should not such physiological substances of one species, when assimilated as substitutes by another species, block vital functions to give the results by which we recognise an antibiotic? If one species of bacterium can assimilate the metabolites of another in this way, might not something similar be involved in pathological changes, brought about by the host cells assimilating products of pathogenic bacteria? The bacterial products capable of substitution might be substances we do not know and would not call toxins, but synthesised into the proteins or enzymes in the host cell they might partially or completely block function. The process would probably be more complex and more protean than the substitution of carbon monoxide for oxygen in oxyhæmoglobin; it might easily involve adaptation, as appears to be the case in antibiotic-dependent strains of bacteria.

The deflection of immunological specificity exhibited by conjugated antigens, and the so-called allergic sensitisation with the use of various drugs, are perhaps suggestive of the reasonableness of this speculation and may indicate a method of investigation of part of the problem. The therapeutic antibiotics show limitations of their effects to states of activity of the bacterial cell, with the suggestion of interference with synthetic processes. There is no reason why inferences drawn from the action of chemotherapeutic agents on bacteria should not be translated to similar action of products of pathogenic bacteria on physiologically active host cells. The interference with biosynthetic processes in the cell would be a biochemical flaw initially, which might or might not ultimately produce visible lesions; and, were it discovered, its elucidation would not only illuminate hitherto unexplained situations but might also bring to light intracellular systems not known now. It may be overbold to say so, but were I working on the problem of cancer I would search for a limited transfer of genetic material for the initiation of malignancy rather than expect to find a parasitic agent.

There is no question that the introduction of antibiotics has profoundly changed the aspect of many infectious diseases, but their multifarious use has introduced complications that are not always easy to cope with. The bacteriologist is therefore often beset with difficulties in isolating the causal organism from a specimen and is burdened with tests to select the most suitable antibiotic or to determine its levels in the patient; but these are technical matters, and there is little he can do to prevent the immediate and unguided use of drugs which may by chance effect a spectacular cure, even without a diagnosis having been made.

Recognising the situation, the bacteriologist has to take note of changes in the regional flora, of the incidence of antibiotic-resistant forms, of the increase in hospital cross-infection (partly due to lapses in technique from a false sense of security the clinician finds offered by the "wonder drugs"), and perhaps of changes in character of well-known pathogens. This last is the most difficult because the change without doubt is insidious and observation must needs be long and careful. But bacteria are responsive living organisms, as subject to evolution now as ever they were in ages past; their generation time is rapid, and the use of a considerable range of tremendously potent antibiotics is extensive in some parts of the world.

If such observations are to be made effectively, a serious interest in arranged classification (based on taxonomy) and regard for the rules of bacteriological nomenclature are imperative. At the same time a search for new criteria for the recognition of bacterial characters is urgently needed; for we may all readily find that those now in use are inadequate for certain groups, however satisfactory they may be for others. A recognisable description of the larger divisions in bacteriological classifications which are at present accepted is very difficult to achieve, because even genera are being rather stuffed with diversified forms (witness the genus Corynebacterium) making the description diffuse.

There are those who protest that there are far too many orders, families, tribes, and genera, contending that the multiplication of names is not only a nuisance but also unnecessary; and at the same time they complain that the descriptions are indefinite. I contend that too many species of widely differing characters are grouped in too few subdivisions, with the result that an all-inclusive description of a family, or even a genus, becomes so general that it is not distinctive. A greater interest in taxonomy, with due regard for the rules of nomenclature and with a critical selection and expansion of the determining criteria, would soon disperse many, if not most, of the present aggravating dissensions.

There is so much that depends absolutely on the exact identification of a micro-organism that there is no justification for relying on opinion and prejudice. It is told that Sir Edmund Gosse was hurrying through South Kensington Natural History Museum with a friend and stopped before a case to say emphatically "That's not my idea of an emu": to which his friend, who stuttered, replied "Well, G-G-Gosse, it's G-God's idea of an emu." It is to be hoped that, as the study of the minute structure of the bacterial cell progresses, it will bring out similarities and divergencies to help in the broad classification of the ever-increasing numbers of described bacteria.

* * *

It is not my purpose here to present factual information, such as can be dug out of the literature and supplemented, with a small increment of personal work, but rather to develop provisional suppositions which might afford reasonable departures for new lines of research. Some twenty years ago a very distinguished American physiologist strongly advised a young friend of mine not to commit himself to bacteriology, because the subject was "a dead end." The intervening period has amply proved how completely wrong his appraisal was.

I do not believe that any subject offers greater opportunities for scientific research with more exciting consequences than does bacteriology. It embodies everything necessary to imaginative interest and adventurous forceful action—which must bring to bacteriology an even greater future than its already marvellous past. But this happy heritage is not for those prone "to sleep on the graves" of great men; and as its building has done, so its furtherance must depend on those "both learned, wise, and stout of stomach."

PHENYLBUTAZONE THERAPY

RELATION BETWEEN THE TOXIC AND THERAPEUTIC EFFECTS AND THE BLOOD LEVEL

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SINCE the introduction of phenylbutazone in the treatment of the rheumatic diseases, many toxic effects have been reported (Steinbrocker et al. 1952, Currie 1952, Kuzell et al. 1952, Granirer 1952, Stephens et al. 1952, Freeland et al. 1953). The incidence has differed considerably in different series; and, while some observers consider phenylbutazone too dangerous for routine use (Granirer 1952), others regard the toxic effects as negligible in view of the benefits obtained (Currie et al. 1953, Selbourne 1953, Kelly 1953).

Some of the confusion is undoubtedly due to the wide variation in dosage, which has ranged from 200 to 1600 mg. daily. The clinical impression has been gained that the dosage most effective by mouth is 600 mg. daily (Stephens et al. 1952), and it has been claimed that by using doses as low as 200 mg. daily the toxic effects can be diminished without loss of therapeutic action (Edgar 1953, Kelly 1953). Blood-phenylbutazone levels estimated in this unit after the oral administration of a standard dose of 600 mg. daily varied considerably from patient to patient. Accordingly we undertook the following investigation into the absorption and excretion of phenylbutazone given by mouth and the correlation of toxic and therapeutic effects with the blood-phenylbutazone level.

Clinical Material and Methods

The trial included fifty-two patients (forty-five women and seven men) aged 28–78. Forty-eight patients had rheumatoid arthritis, and the remaining four osteoarthritis. In addition four patients were admitted to hospital for detailed short-term studies of blood-phenylbutazone levels and urinary excretion; those on the trial proper attended as outpatients. All fifty-two patients were treated for at least a month on a fixed dosage to assess therapeutic response and the incidence of toxic effects; thirty patients were kept in the trial for longer periods, up to 4 months, so that we could observe the effects of alteration in dosage.

All the patients received phenylbutazone by mouth in the form of enteric-coated tablets. During the first month of their treatment nine patients were given 1200 mg., nineteen 600 mg., eight 400 mg., and sixteen 200 mg. daily.

The first nineteen patients, each of whom received 600 mg. daily, were seen as outpatients twice weekly. After this only patients who were on 1200 mg. a day were seen as frequently, those on a lower dosage attending once a week. At each attendance blood was taken for estimation of the phenylbutazone level. The urinary excretion of phenylbutazone was estimated daily in the patients admitted to hospital. The levels of phenylbutazone in blood and urine were estimated by a modification of Pulver's (1950) method. Blank values of up to 0·8 mg. per 100 ml. in blood and 4 mg. per 24 hours in urine were obtained.

Results

ABSORPTION AND EXCRETION OF PHENYLBUTAZONE

Fig. 1 shows the results of administering phenylbutazone 1200 mg. daily for 12 days to a man, aged 31, with rheumatoid arthritis. Both blood levels and urinary output increased during the first 10 days to reach a peak of 14·8 mg. per 100 ml. and 410 mg. per 24 hours respectively. After the cessation of phenylbutazone therapy urinary excretion of phenylbutazone continued and blood levels remained raised for an appreciable period. In this case blank levels were not attained until 14 days after stopping administration of the drug. This retention of phenylbutazone was a constant feature in all the cases studied, and suggests that the tissues become saturated with it. In ten patients whose blood-phenylbutazone levels were estimated after stopping the drug the time taken to reach a blank value ranged from 10 to 21 days, with a mean of 14 days. There was no correlation between duration of therapy and the time taken to reach a blank value. It can be seen that toxic effects may arise after stopping phenylbutazone, and this did in fact happen in one of our cases, severe generalised urticaria appearing 4 days after withdrawal of the drug because of epigastric pain and vomiting.

Fig. 2 shows all the blood levels obtained with the various dosages. Midway through the investigation levels began to fall off sharply. This proved to be due to an alteration in the enteric coating of a new batch of tablets which considerably diminished absorption. Patients were then instructed to divide their tablets in half before taking them; there was an immediate rise in blood-phenylbutazone levels without any increase in the incidence of dyspeptic symptoms, and it is now our practice to advise all patients to divide their tablets in this way. All the patients on 200, 400, and 1200 mg. daily were affected by the alteration in coating, as were those on 600 mg. daily who had continued on treatment after the first month. Blood-phenylbutazone levels estimated during the fortnight when the new batch of tablets were administered whole have been excluded from the chart.

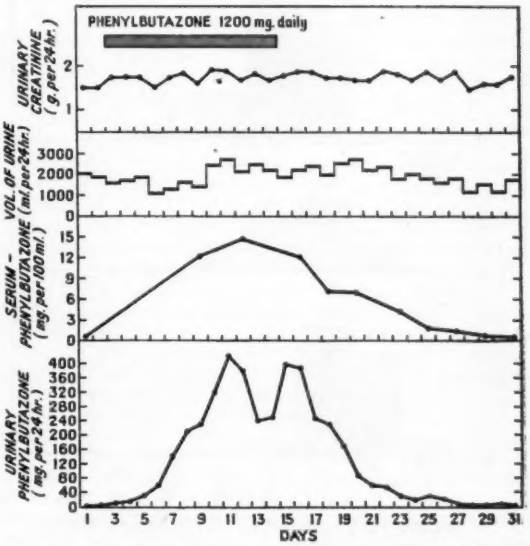
PHENYLBUTAZONE 1200 mg. daily
URINARY CREATININE (g. per 24 hr.)
VOL. OF URINE (ml. per 24 hr.)
SERUM - PHENYLBUTAZONE (mg. per 100 ml.)
URINARY PHENYLBUTAZONE (mg. per 24 hr.)
DAYS

Fig. 1—Results of administering phenylbutazone 1200 mg. daily for 12 days to a man, aged 31, with rheumatoid arthritis.

It can be seen that, between dosages of 200 mg. and 600 mg. daily, each additional 200 mg. increases the blood-phenylbutazone level by 2 mg. per 100 ml., whereas when the dosage is increased from 600 to 1200 mg. daily the blood level only rises by 3 mg. per 100 ml. Individual variations in the blood level from patient to patient on a fixed dosage are considerable; the average monthly levels of the nineteen patients on 600 mg. a day were 7–13 mg. per 100 ml.

TOXIC EFFECTS

Toxic effects were noted in twenty-five patients (48%), and in several cases there were more than one. Listed in order of frequency they were:

Toxic effects	*No. of cases*
Epigastric pain and vomiting	7
Dry mouth	6
Buccal ulceration	5
Œdema	5
Urticaria	4
Diarrhœa	2
Headache	2
Purpura	1
Precipitation of oliguria and renal failure	1
Total	33
No. of patients	52

Of 52 patients treated 25 (48%) showed toxic effects.

We classify as *severe* those toxic effects that made it necessary to stop giving the drug, either at the patient's request or because the doctor thought it dangerous to continue.

Mild toxic effects (60% of the total) either caused little inconvenience or were transitory. Epigastric pain with vomiting was met with in both mild and severe forms, and so was buccal ulceration. Treatment was stopped in five out of seven cases of the former, but in only one out of five of the latter.

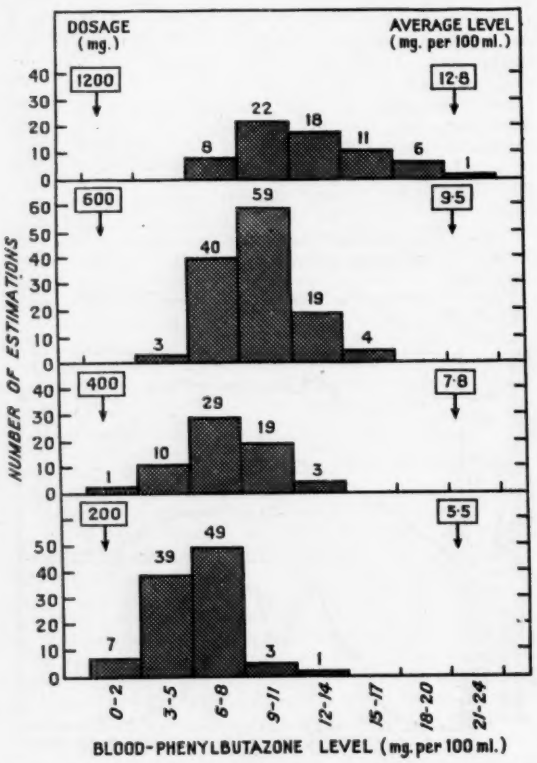

Fig. 2—Blood-phenylbutazone levels on different dosages of phenylbutazone.

TABLE I—RELATION OF BLOOD-PHENYLBUTAZONE LEVEL TO TOXIC EFFECTS

	Average monthly blood-phenylbutazone level (mg. per 100 ml.) and incidence of toxic effects				
	0–4	5–9	10–14	15 or higher	Total
No of patients:					
Without toxic effects	7	18	2	0	27
With toxic effects	1 (12%)	11 (37%)	12 (85%)	1	25
Mild	1 (12%)	8 (27%)	5 (35%)	1	15
Severe	0	3 (10%)	7 (50%)	0	10
Total	8	29	14	1	52

Between groups 0–9 mg. and 10–15 mg. $\chi^2 = 12{\cdot}58$ ($P < 0{\cdot}001$).

Urticaria was generalised in all cases and did not respond to antihistaminics while phenylbutazone was continued.

In one instance urticaria coincided with severe epigastric pain and vomiting, which obliged the patient to stop taking phenylbutazone.

One patient developed severe generalised urticaria after three weeks' therapy with 600 mg. daily; the blood-phenylbutazone level was 8·6 mg. per 100 ml. The urticaria disappeared after withdrawal of phenylbutazone, and subsequently she was given phenylbutazone 200 mg. daily for three months without recurrence of the skin rash; the average blood level over this period was 5·4 mg. per 100 ml.

A woman, aged 65, with rheumatoid arthritis developed purpura of the legs after 2 weeks' therapy with 600 mg. daily. The capillary-resistance test was positive, and the platelet-count 200,000 per c.mm.; bleeding-time and clotting-time were normal. The blood-phenylbutazone level was 14·6 mg. per 100 ml. on the day after the onset. Phenylbutazone was withdrawn, and the rash faded. 2 weeks later treatment with phenylbutazone 600 mg. daily was begun again, and after 3 days the purpuric rash recurred, the blood level being 10 mg. per 100 ml.

One patient died while on phenylbutazone therapy:

A woman, aged 78, with rheumatoid arthritis of 3 years' duration was started on phenylbutazone 600 mg. daily on April 23, 1953. Her erythrocyte-sedimentation rate was 50 mm. in 1 hour (Westergren) and hæmoglobin 80% (11·8 g. per 100 ml.). Response to treatment was good, joint pain and stiffness lessening considerably. On May 18 she complained of slight nausea and an "empty feeling"; apart from this she felt well. Nothing was found on examination beyond very slight epigastric tenderness. The blood-phenylbutazone level was 16·9 mg. per 100 ml. Next day she developed dryness of the mouth and general malaise, and during the next 3 days she became drowsy and passed only a few ounces of urine. She was admitted to hospital on May 24, having taken no phenylbutazone for 3 days.

On admission she was drowsy and somewhat confused. Her temperature was 99·6°F, pulse-rate 100, and respirations 20 a minute. Her mouth was dry and her tongue thickly coated. She had moderate œdema of legs and sacrum. Her blood-pressure was 140/80 mm. Hg, and her cardiovascular and central nervous systems were normal. There were bilateral moist crepitations at the lung bases. The abdomen was distended, but bowel sounds were normal. The liver, spleen, and kidneys were not palpable.

Investigations.—A small quantity of concentrated urine obtained with a catheter contained albumin but no blood or sugar. Microscopy showed a fair number of granular casts and a few red cells. The urine was sterile on culture. The blood-urea level was 136 mg. per 100 ml. A blood-count showed Hb 60% (8·87 g. per 100 ml.) and white-cells 16,400 per c.mm. (polymorphs 79%, lymphocytes 20%, monocytes 1%). Radiography of the chest showed bilateral basal congestion of the lungs.

Treatment and Course.—The patient was given glucose fluids in restricted amounts and penicillin systemically. During the 24 hours after admission she passed 10 oz. of urine, and the following day 17 oz. Thereafter she improved considerably, and by May 27 the intake and output were

50 and 42 oz. respectively. Her temperature was 98·6°F, and the blood-urea level had fallen to 60 mg. per 100 ml. Improvement continued until June 6, when she suddenly passed a quantity of bright-red blood in her urine. Hæmaturia continued on and off for a week, and on June 13 cystoscopy revealed a generally congested bladder mucosa without any other abnormality; urine culture was again sterile. The urinary output again decreased, and on June 13 and 14 she passed $3^1/_2$ and $2^1/_2$ oz. respectively. The blood-urea level rose to 118 mg. per 100 ml., and on June 16 she died suddenly.

Necropsy Findings.—The lungs showed hypostatic congestion at the bases and evidence of chronic bronchitis. The heart was normal in size, and the coronary arteries and aorta were normal for the age. The heart muscle was pale and soft. The liver and spleen were normal. Both kidneys were small and markedly granular. The bladder showed generalised injection of the mucosa but no other abnormality.

Histology.—Portions of kidney, lung, liver, and bladder all showed changes due to post-mortem autolysis. The kidney showed changes resulting from hypertension and past pyelonephritis; there were degenerative changes in the convoluted tubules, some of which probably preceded death. The liver showed fatty changes and venous congestion, and the lungs considerable congestion. The bladder showed chronic cystitis.

Although there is no evidence that phenylbutazone was a direct cause of death, we feel that there is a strong probability that its salt-retaining effect precipitated oliguria and renal failure.

CORRELATION OF TOXIC EFFECTS WITH BLOOD-PHENYLBUTAZONE LEVEL

Since not all patients were treated for longer than a month, toxic effects developing during the first month only are considered. The majority of toxic effects develop in the 2nd and 3rd weeks of treatment if the dose is kept constant, but we have seen sporadic toxic effects developing up to the 6th month of treatment. Table I shows that the number of patients developing toxic effects increases rapidly as the blood-phenylbutazone level (expressed as an average for the month) rises. In the 0–4 mg. group only one in eight patients (12%) developed a toxic effect, whereas in the 5–9 and 10–14 mg. groups the figures are eleven in twenty-nine (37%) and twelve in fourteen (85%) respectively. The difference in the number of patients with blood levels above and below 10 mg. per 100 ml. who developed toxic effects is statistically significant ($P<0.001$).

CORRELATION OF THERAPEUTIC EFFECTS WITH BLOOD-PHENYLBUTAZONE LEVEL

The mode of action of phenylbutazone in the rheumatic disorders is not yet known. Currie et al. (1953) state that relief of pain is its most obvious therapeutic effect, and with this we agree. Whether the benefits obtained can be attributed solely to its analgesic action is a matter of some controversy. Claims have been made that in early cases of rheumatoid arthritis joint swelling is diminished and the activity of the disease suppressed (Currie 1952, Kelly 1953). In the present series and in other patients treated by us we have been unable, even in early cases, to demonstrate any effect on joint swelling measured by ring sizes and tape-measure, reduction of effusions, or fall in the erythrocyte-sedimentation rate. Reduction of joint tenderness and increase in strength of grip were common; but, as Mason (1953) points out, this may well be a reflection of analgesia.

TABLE II—RELATION OF BLOOD-PHENYLBUTAZONE LEVEL TO SUBJECTIVE RESPONSE

—	Average monthly blood-phenylbutazone level (mg. per 100 ml.) and subjective response			
	0–4	5–9	10 or higher	Total
No. of patients showing:				
No improvement ..	6 (75%)	4 (14%)	1 (6%)	11
Some improvement ..	2 (25%)	6 (12%)	4 (27%)	12
Much improvement ..	0	19 (65%)	10 (67%)	29
Total	8	29	15	52

Between groups 0–4 mg. and 5–9 mg. P = 0·00065 (exact test).

In the absence of definite objective improvement we feel that it is valid to use the patients' subjective response for comparing the therapeutic effects of different blood-phenylbutazone levels. We have classified the responses into three grades—no improvement, some improvement, and marked improvement. Table II shows the blood levels of patients in these groups. From this it can be seen that, when the average blood-phenylbutazone level for the month was below 5 mg. per 100 ml., only 25% of patients experienced relief of symptoms. When it was above 5 and under 10 mg. per 100 ml., 86% of patients experienced relief of symptoms, and in 65% this improvement was considerable. The difference between the two groups is statistically significant ($P = 0.00065$). With blood levels above 10 mg. per 100 ml. the results were very similar to the 5–9 mg. per 100 ml. group, 94% of patients experiencing relief and 67% marked relief of symptoms.

We also observed the effects of increasing and decreasing the dose in individual patients who had completed the initial month's treatment. Here again evidence accumulated that the optimal blood-phenylbutazone level lay between 5 and 10 mg. per 100 ml. Within this range the degree of subjective relief might continue to increase in any particular patient, but in no case did an increase in the blood level of more than about 10 mg. per 100 ml. produce further improvement. When the dosage was adjusted to reduce the blood level below 5 mg. per 100 ml., relapse was common, although a few patients maintained significant improvement.

Discussion

Currie et al. (1953) state that for suppression of symptoms in rheumatoid arthritis a blood-phenylbutazone level of 8–11 mg. per 100 ml. appeared to be necessary, whereas for maintenance therapy levels of 4·6–8 mg. per 100 ml. are adequate. In our experience maximal suppression of symptoms may occur at any level between 5 and 10 mg. per 100 ml.; and, once an adequate therapeutic level has been reached in a particular patient, any significant reduction in blood-phenylbutazone often leads to relapse.

It was originally hoped that it would be possible to correlate toxic and therapeutic effects with dosage, but this was precluded by an alteration made by the makers in the enteric coating of the capsules. Nevertheless the striking correlation between the frequency of toxic effects and the blood-phenylbutazone level suggests that recorded variations in the incidence of toxic effects are largely due to differences in the dosage schedules used. A critical level as regards both toxic and therapeutic effects appears to be about 10 mg. per 100 ml.; for above this level clinical improvement ceases and the incidence of toxic effects is greatly increased. In our series the administration of phenylbutazone had to be stopped in half the patients whose blood level averaged above 10 mg. per 100 ml. during the month.

The occurrence of a severe toxic effect does not necessarily preclude further treatment. After subsidence of the toxic effect we have sometimes been able to continue treatment with a lower dosage without recurrence. No toxic effect severe enough to stop treatment was observed with blood-phenylbutazone levels below 5 mg. per 100 ml. Unfortunately few patients responded clinically at this level, and in no case was the effect dramatic.

Variations in the blood-phenylbutazone level from one patient to another on a fixed dosage of oral phenylbutazone were considerable. Thus a patient receiving 600 mg. daily might fall either into the 5–9 mg. per 100 ml. group (severe toxic effects 10%) or the 10–14 mg. per 100 ml. group (severe toxic effects 50%). In view of this it is impossible to formulate a dosage which will ensure a therapeutic level in most patients with a minimum of toxic effects. Dispensing with the enteric coating of the capsules eliminates the possibility of tablets passing unchanged through the alimentary tract but does not solve the problem of variations in blood level. Ideally it would be desirable to adjust the dosage according to blood levels; but the estimations are tedious and time consuming and are unlikely to become routine laboratory procedure. It seems rational, however, to start treatment with 200 mg. daily and to increase the dosage by 100 mg. daily if the response is unsatisfactory, bearing in mind that with a dosage greater than 400 mg. a day the chances of a severe toxic effect increase rapidly.

Summary and Conclusions

An investigation was made into the relation between the toxic and therapeutic effects of phenylbutazone and the level of the drug in the blood.

Using various dosages, it was found that the incidence and severity of the toxic effects increased as the blood-phenylbutazone level rose.

The therapeutic effect was greatest when the blood-phenylbutazone level was about 10 mg. per 100 ml. Few patients with blood levels below 5 mg. per 100 ml. showed any clinical response.

We wish to thank Dr. W. S. C. Copeman and Dr. Oswald Savage for allowing us to treat patients under their care and for much helpful advice and criticism; Dr. H. E. Archer for advice on the estimation of phenylbutazone; Dr. R. Pearce for reporting on the histological sections; and Dr. K. Knowlden for the statistical analysis. Messrs. Geigy supplied pure phenylbutazone for use in blood and urine estimations.

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"... Because the Victorians regarded work in industry as necessarily hard and disagreeable, they made little effort to introduce tolerable conditions into mines, and mills, and foundries, and were content to think of industry itself as an economic necessity instead of as an element in society. This was to exclude the industrial worker from the benefits of culture, and also to misunderstand both the nature of work and the nature of culture. Soon it was only those who earned their living with their minds who expected to find work satisfying. ... We have already got rid of most of the intolerable conditions, and we should now, surely, proceed to put this to use by developing the human relations which the new conditions can support. The machine itself can be turned to advantage. The less any work may demand of the individual person, the more it can be made to involve him with other people. The social opportunities of the factory seem to me virtually unlimited, and still hardly explored. It seems to me that these could be developed both as an essential part of the work organised within the factory walls, and then, also, in the development of relations between the factory and the neighbourhood, where the factory does not need to play the part of patron but merely to carry out the functions of any social nucleus in local community life."—CHRISTOPHER SALMON, *Listener*, Dec. 31, 1953, p. 1123.

SURGICAL MANAGEMENT OF GASTRODUODENAL HÆMORRHAGE

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SEVERAL large series of cases have been published indicating the value of combined conservative and surgical treatment in the management of the bleeding peptic ulcer; these reports have come, mainly, from clinics specialising in the treatment of gastroduodenal ulceration. I present here some observations arising from the analysis of 17 cases which have come to operation at a small surgical centre in fifteen months. The cases have been reviewed critically in an attempt to formulate a policy for the management of future cases.

The details of the cases are set forth briefly in table I. Table II explains the terms used in discussing the type of management in each case. The headings under which the discussion is placed indicate the features which were found to be of importance during the course of the analysis.

Elderly Patients and Patients with Concomitant Medical Lesions

Of the 4 fatal cases 3 (cases 1, 4, and 9) were in patients aged more than 70. Nevertheless it was not alone the fact that these elderly patients underwent an operation which caused their deaths; other factors were involved, and it will be seen that 2 other patients, aged more than 70, were operated on successfully (cases 16 and 17).

Case 1, aged 72, was on the hospital waiting-list to come in for partial gastrectomy; but when he was admitted after a hæmatemesis, which reduced his Hb to 38% and his blood-pressure from 160/90 mm. Hg to 90/55 mm. Hg, he was treated under the principle of selective surgical intervention. Five days' conservative treatment was followed by a further hæmatemesis, and partial gastrectomy was then done. His abdominal wound subsequently ruptured, and after resuture he died of pulmonary embolism. There is little doubt that at the age of 72 blood-transfusion followed by operation on the day of admission would have improved this patient's chance of survival because five days' debilitating illness would have been avoided before the additional stress of operation. The added five days in bed probably had a bearing on the occurrence of pulmonary embolism.

Case 4, aged 76, had Hb 38% when admitted after a hæmatemesis. He received a blood-transfusion but by the third day he had lost all benefit of it, his Hb being again 38%. He died of chronic pyelonephritis and myocardial disease three days after partial gastrectomy. Immediate operation would have spared his already impaired tissues an additional three days' strain and would thereby have increased his chance of survival.

Case 9 suffered from delay in recourse to surgery. Obviously his age, 77 years, and his condition, which rendered him incapable of giving a history, were deterring factors; but it is questionable whether anything save partial gastrectomy holds out a hope of recovery to such a patient whose Hb has decreased to 26%. At operation no ulcer was found and partial gastrectomy was not done; the patient died of continued bleeding. An ulcer was found in the stomach at necropsy.

Thus it seems likely that 2 of these patients would have benefited from early surgery and the 3rd from a better appreciation of the necessity for gastric resection even in the absence of an obvious ulcer when no other causal lesion can be found.

Nevertheless patients aged 70 or more present a very difficult problem. Avery Jones (1950) comments:

"It is likely that the maximum benefit from partial gastrectomy for bleeding ulcer will be between the ages of 45 and 70. Over 70 there are so often serious associated medical conditions which militate against successful surgery."

Despite the obvious truth of the latter part of this statement I am of the opinion that surgery has an

TABLE II—TYPES OF MANAGEMENT

Type I—*Ultraconservative :* operation only as last resort when conservative treatment has failed.

Type II—*Selective Surgical Intervention :* operation in presence of certain criteria known to carry high mortality on medical treatment—e.g., aged more than 45, particularly if male ; proved ulcer, particularly if gastric ; if bleeding recurs or persists while under treatment.

Type III—*Immediate Operation :* for all cases of bleeding ulcer with definite history of peptic ulceration.

Type IV—*Initial Medical Treatment :* if very short or no history of ulcer ; *early* operation if bleeding persists or recurs.

important place in the management of the patient aged more than 70, and that it is here that its life-saving potential may be most dramatically applied. "Serious associated medical conditions" do not improve if the patient continues to bleed. A long-drawn-out illness wearies the patient bodily and mentally, leaving him without the will to fight, and recurrent crises of anoxia are not good for the elderly myocardium.

In the present series one of the problems most difficult of solution—indeed not yet solved to complete satisfaction—has been the maintenance of the elderly patients' condition at the postoperative stage when they should be relinquishing milk feeds and beginning to take solid diet. One finds that they have lost all interest in food ; the effort of feeding themselves is not, they feel, worth while ; they are lethargic, loth to eat, and fickle of appetite. It has required great skill and endeavour on the part of the nurses to tempt them to take even the smallest and most tasty helpings. These patients have been wearied by operation and, in my opinion much more important, by a debilitating preoperative illness ; if this could be shortened by early operation, with consequent early cessation of hæmorrhage, I am certain that the chance of recovery would be greater than it is with delayed operation or with conservative treatment. Therefore there should be no hesitation in operating on the patient aged more than 70 with a proved ulcer or with a typical history.

What has been written about the elderly patient applies also to the patient with a concomitant medical lesion, especially angina of effort and coronary disease. Such a patient derives naught but ill from recurrent hæmorrhage, even though transfusion replaces the lost blood. A low Hb level not only diminishes the nutrition of the myocardium but also increases the work required of it to keep the distant tissues adequately oxygenated. With each successive episode of bleeding the patient's condition deteriorates. Therefore, in patients aged more than 60 with myocardial damage, immediate operation, applied with judgment, is preferable to operation after several bouts of hæmorrhage.

TABLE I—ANALYSIS OF CASES

Case no.	Sex	Age (yr.)	H or M	Lesion	Previous radiograph	Former H or M	Condition on admission			Blood-transfusion (pints)	Day on which bleeding recurred	Operation		Complication	Result	Cause of death	Type of management (see table II)		Reason for change of management
							Hb %	Pulse-rate	Blood-pressure (mm.Hg)			Type	Day				Used	Now chosen	
1	M	72	H	D.U.	Yes	No	38%	108	99/55	6	5th	P.G.	5th	Burst abdomen	Died	Pulmonary embolism	II	III	On waiting-list for gastrectomy, age 72, Hb 38%
2	F	52	H	Gastritis	No	No	50%	90	130/85	5	2nd	P.G.	2nd		Recovery		II	II	
3	M	53	M	D.U.	Yes	Yes	65%	80	110/75	3	2nd, 3rd	P.G.	3rd	Wound infection	Recovery		II	III	Previous hæmatemesis
4	M	76	H	G.U.	Yes	No	38%	110	82/42	6	3rd	P.G.	3rd		Died	Myocardial disease. Pyelonephritis	II	III	Proved ulcer, age 76, Hb 38%
5	F	29	H	Gastritis	No	No	85%	88	125/70	4	2nd, 6th	L.	6th		Recovery		IV	IV	
6	M	61	M	G.U.	Yes	Yes	71%	120	115/110	2	8th	P.G.	8th	Wound infection	Recovery		II	III	Previous hæmatemesis
7	M	53	H	Gastritis	No	No	38%	70	110/70	9	5th	P.G.	5th		Recovery		IV	IV	
8	M	65	M	D.U.	Yes	No	42%	104	140/80	7	6th, 7th	P.G.	7th		Recovery		II	III	Proved ulcer, age 65
9	M	77	M	G.U.	No	No	26%	124	115/45	11	3rd, 4th	L.	4th		Died	Continued bleeding	IV	IV	
10	M	54	H	G.U.	No	No	..	72	126/70	2	11th	P.G.	11th	Anastomotic leak	Died	Peritonitis	II	II	
11	F	63	H	G.U.	No	Yes	71%	130	145/100	5	2nd	P.G.	2nd		Recovery		II	III	Previous hæmatemesis
12	F	69	M	G.U.	Yes	Yes	56%	130	110/60	6	2nd	P.G.	2nd	Pressure sore	Recovery		II	III	Previous hæmatemesis, age 69
13	M	69	H	G.U.	No	No	63%	80	180/80	6	8th	P.G.	8th	Lung abscess	Recovery		II	III	Coronary thrombosis, age 69
14	M	54	H	G.U.	No	No	56%	98	96/80	3	..	P.G.	1st	Venous thrombosis	Recovery		III	III	
15	F	39	M	G.U.	Yes	No	34%	102	100/60	4	..	P.G.	1st		Recovery		III	III	
16	F	72	H	G.U.	No	No	74%	100	150/80	9	2nd, 11th	P.G.	14th	Wound infection	Recovery		II	III	Angina of effort, age 72
17	F	73	H	G.U.	No	No	50%	108	104/50	7	3rd	P.G.	3rd	Venous thrombosis	Recovery		II	III	Age 73

D.U., duodenal ulcer. G.U., gastric ulcer. H, hæmatemesis. L, laparotomy only. M, melæna. P.G., partial gastrectomy. Day of admission counted as 1st day.

Previous Hæmatemesis

4 patients (cases 3, 6, 11, and 12) had had hæmatemesis previously and had ulcers demonstrated radiographically. They received type-II management (selective surgical intervention), had recurrent hæmorrhage, and were operated on. These patients were aged 53, 61, 63, and 69, and in each case the Hb was more than 50%—the arbitrary figure often set as the level below which transfusion is indicated—being 65%, 71%, 71%, and 56%. It seems clear from this that patients such as these, aged more than 45, with a known ulcer and a history of previous hæmatemesis, should be treated by immediate operation notwithstanding the Hb level.

Presence of a Proved Ulcer

The patient with a radiographically proved ulcer may be treated either by the principles of selective surgical intervention (type-II management) or by immediate operation (type-III management). Other factors, such as a history of hæmatemesis, may influence the decision, but generally the age provides a guide; the young patient should be given a chance to retain his stomach (selective surgical intervention), whereas immediate operation should be advised for the patient aged more than 60.

In this series only 2 patients with a proved ulcer were aged less than 60: case 3, who by reason of a previous hæmatemesis comes into the immediate-operation group; and case 15, who, though aged only 39, was treated by immediate partial gastrectomy because she had recently undergone an intensive course of medical treatment. The occurrence of such a serious complication of gastric ulceration as massive hæmatemesis within a short time of efficient medical treatment is sufficient ground for recommending immediate gastric resection.

Site of Ulcer

Of the 17 patients 11 were bleeding from gastric ulcers. It therefore seems that the confirmed presence of a gastric ulcer in a patient with hæmatemesis or with melæna is a consideration in favour of early operation.

Negative Exploration

No ulcer was found at operation in 4 patients (cases 5, 7, 9, and 17). The correct procedure to adopt in such circumstances, together with the application of gastrotomy, has recently been discussed (Ferguson 1953), when the opinion was advanced that, when no ulcer is found at laparotomy and there is no other obvious cause for the hæmorrhage, partial gastrectomy should be done.

Biochemistry

Case 10 died from complete rupture of the anastomosis despite the fact that his Hb was satisfactory and his blood-chemistry normal. There was no macroscopic evidence of healing. This fact emphasises how malnourished these patients are likely to be, and that important restorative and corrective measures may have to be taken before operation. In the modern treatment, conservative and surgical, of bleeding ulcer the clinical pathologist and biochemist is a full partner. All patients bleeding from gastric or duodenal ulcers should be regarded as potentially deficient in vitamins and treated accordingly, especially as regards the B-complex and vitamin C.

Fatal Cases

4 of the 17 patients died (cases 1, 4, 9, and 10). Case 1 died of pulmonary embolism following rupture and resuture of the abdominal wound; case 4 died of chronic pyelonephritis and myocardial disease; case 9 succumbed to continued bleeding, partial gastrectomy not having been done, because no ulcer was found at operation; and case 10 died from peritonitis due to rupture of the anastomosis. 1 death might have been avoided by the use of adequate surgery; 1 other death demonstrates the increased risk due to the concomitant lesions which are common in elderly patients and are (it is considered) minimised by early operation; and 2 other deaths give evidence of the poor state of nutrition of many patients with bleeding ulcers.

Complications

The factor of poor nutrition is further emphasised by the fact that 7 of the surviving patients had grave post-operative complications: 3 had severe wound infections, 2 developed venous thrombosis, 1 had a pressure sore, and 1 had a lung abscess.

That of 17 patients 3 had thrombo-embolic complications is not without significance. Stoner and Green (1947) investigated the clot-promoting activity of muscle which had been rendered anoxic, and found that it was considerably in excess of that of normal muscle. The clot-promoting activity increased rapidly with increasing periods of muscle ischæmia, and an extract made after 4–6 hours was 200% more active than a normal muscle extract. They concluded that ischæmia leads to the mobilisation of thromboplastin stored in an inactive form in the cells. These findings seem to be applicable to hæmatemesis in that, in addition to the surgical trauma of operation, another factor—ischæmia—predisposes to thrombo-embolism. If this is so it constitutes a strong argument in favour of early and adequate transfusion.

Transfusion

It has been customary to set an arbitrary figure, usually 40–50%, below which blood-transfusion is indicated. Lewis (1950) states:

> "There is one other thing still more important in my opinion; not to transfuse him if his hæmoglobin is over 50%. The blood should be held in reserve; if the hæmorrhage does not recur he will not need it; if it does he will need it all, before, during, and after operation."

The problem is not quite as simple as that. The elderly patient with coronary disease whose Hb is 50% will not thrive until his capacity to oxygenate his tissues is increased. A slow transfusion of packed cells may be of great benefit in such a case. It is difficult to fix a minimum above which transfusion is unnecessary. Probably all patients with Hb below 70% should be considered with a view to transfusion. Young patients whose Hb is just below this level may not require blood, but certainly all patients older than 55 with Hb 70% or less will benefit from judicious transfusion and will be in far better shape to withstand operation should it become necessary.

Early transfusion and, when indicated, operation will effect a great economy in blood; this is not a negligible factor, as has previously been emphasised by Ogilvie et al. (1952). In this series blood would have been spared by readier recourse to type-III management (immediate operation) and, as is shown in table I, it is considered that this would have been preferable, for various reasons, in several of the cases.

Surgical Facilities

All patients with gastroduodenal hæmorrhage must be treated in hospitals with adequate surgical facilities. 2 patients in this series were admitted to a hospital temporarily without such facilities and, when the hæmorrhage recurred, it became necessary to transfer them to another hospital. It was noticeable that the physical disturbance of the transfer caused considerable deterioration in the patient's condition and consequently an increase in the risk to life.

Conclusions

It is essential to follow a definite plan in the management of the bleeding ulcer. Tanner (1950) has adequately

demonstrated the superiority of the fixed-policy method when applied with discrimination and, when necessary, with some flexibility.

Close coöperation between physician and surgeon is necessary. Ideally each case would be seen by the physician-in-charge, and the surgeon with whom he coöperates, on admission. In this way the surgeon to whose lot it will fall to operate, should this become necessary, will be in a position to appreciate any alteration which may have taken place in the patient's condition. It would be well if physicians and surgeons worked together in regular teams in this regard; nor should the important and active part to be played by the clinical pathologist be forgotten.

Of the four management types indicated in table II, type I—more correctly termed mismanagement—should no longer be tolerated. A combination of type II with type IV or of type III with type IV would cover most cases. The second combination, in that type III advocates early operation for more patients than does type II, would be economical of blood, and this deserves consideration because the supply of blood is not unlimited; but, on the other hand, it would probably lead to the unnecessary sacrifice of many stomachs. Tanner (1950) reports operating on 60% of 183 cases under this policy, whereas under selective surgical intervention he operated on, in one period, 11% of 312 cases. He writes:

"There is, however, one great advantage in this frequent surgery. When we discharge patients on whom we have performed a gastrectomy for hæmatemesis, most of them are rid of their ulcer trouble for ever. When we discharge them after conservative treatment we know that many will return with bleeding, and some will die of it."

Nevertheless there is a growing realisation that partial gastrectomy is not without its unpleasant sequelæ; even apart from the various types of post-gastrectomy syndrome it is questionable whether the gastrectomised patient is ever again quite the man he was. Can one, for instance, confidently assure the labouring man that he will be fit to return to heavy labouring?

Cases may be classified as follows and treated accordingly:

(1) Patients aged less than 45: conservative treatment. Case 15, aged 39, who bled after medical treatment is the exception to test this rule, as may be a patient aged less than 45 who has had a previous hæmatemesis.
(2) Patients aged more than 45:
  (*a*) Aged 45–60: selective surgical intervention.
  (*b*) More than 60, with proved ulcer or typical history: immediate operation (more especially if aged more than 70).
  (*c*) More than 60 without history of ulcer: initial conservative treatment but *early* surgery if bleeding recurs or continues.
  (*d*) Previous hæmatemesis: immediate operation.
  (*e*) Concomitant medical lesion (e.g., coronary disease) immediate operation.

It is realised that the classification offered is more elaborate than those usually suggested. The greater degree of subdivision is the result of an attempt to balance early surgery against excessive surgery. 60% surgical treatment, cited from Tanner (1950), seems very high, and an attempt has been made to reduce the number falling into the immediate-surgery group by retaining selective surgical intervention for patients aged 45–60; there are certain exceptions, of course—e.g., previous hæmatemesis, and recent intensive medical treatment for the ulcer. Nevertheless experience may dictate the extension of immediate surgery to an increasing number of patients.

Summary

The management of 17 cases of gastroduodenal hæmorrhage, treated surgically, has been analysed.

Blood-transfusion is necessary for most patients whose Hb is less than 70%.

Surgery has an important place in the management of the elderly patient.

It is suggested that patients should be grouped for treatment as follows:

(1) Aged less than 45: medical treatment.
(2) Aged 45 or more:
  (*a*) Aged 45–60: selective surgical intervention.
  (*b*) Previous hæmatemesis: immediate operation.
  (*c*) More than 60 (particularly if more than 70 or with coronary disease): immediate operation.
  (*d*) More than 60 without history of peptic ulceration: initial medical treatment, and *early* surgery if bleeding recurs or continues.

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INFLUENCE OF PROTEIN METABOLISM ON BACTERIAL ALLERGY

ITS RELATION TO CORTISONE DESENSITISATION

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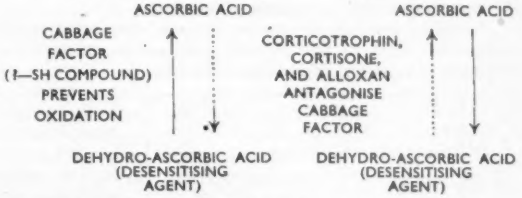
ASCORBIC acid depresses sensitivity to tuberculin in guineapigs fed on Bruce and Parkes's (1947) diet 18; a factor in cabbage prevents this desensitisation; dehydro-ascorbic acid, the first oxidation product of ascorbic acid, depresses sensitivity either in the presence or in the absence of the cabbage factor. This substance in cabbage which apparently prevents the oxidation of ascorbic to dehydro-ascorbic acid is antagonised by cortisone. It was thought that the cabbage factor might be an —SH compound, for one such compound—reduced glutathione—did inhibit ascorbic-acid desensitisation, and conversely alloxan (which combines with —SH compounds) desensitised in a manner resembling that of cortisone (Long et al. 1951c, Cornforth and Long 1953):



Preliminary attempts to show the presence in cabbage leaf of effective amounts of such a "factor" proved unsuccessful (Cornforth and Long, unpublished), and the matter was left in abeyance until the chance investigation of a seasonal disease in young guineapigs led us (Long and Niven, unpublished) to postulate that diet 18, which hitherto had been thought to be deficient only in ascorbic acid (Bruce and Parkes 1947), contained suboptimal quantities of sulphur-containing amino-acids, and that cabbage given to provide ascorbic acid was, in addition, an important source of protein. 5% of the 30% grass meal in diet 18 was therefore replaced by skimmed milk, giving the experimental diet 18A.

With these considerations in mind, the problem of cortisone/cabbage-factor/ascorbic-acid relationships to tuberculin-sensitivity was reinvestigated. Skimmed milk was shown to have properties similar to those of the "cabbage factor"; methionine, probably in suboptimal quantities in diet 18, and present in cabbage and skimmed milk,

ANALYSIS OF THE RESULTS IN EXPERIMENT 1

Agent	Variance ratio*	P	Potency ratio
Cabbage	<1·0	—	1·05
Ascorbic acid	9·4	< 0·01	0·70
Cortisone	7·0	< 0·05	0·77
Cabbage and ascorbic acid	6·5	< 0·05	0·77
Cortisone and ascorbic acid	55·3	< 0·001	0·38
Cabbage and cortisone	174·9	< 0·001	0·29
Cabbage and ascorbic acid and cortisone	63·7	< 0·001	0·30

* Ratio of " between treatments " variance to error variance.

shared these properties ; ethionine, an antimetabolite for methionine, antagonised both the " cabbage factor " and skimmed milk, and so depressed sensitivity to tuberculin; it was without effect in guineapigs deficient in ascorbic acid, and its desensitising action was prevented by injection of reduced glutathione. These facts suggest that cabbage, skimmed milk, or methionine inhibit ascorbic-acid desensitisation, and that cortisone and ethionine antagonise this effect. The effect of cabbage, and of skimmed milk, on ascorbic acid is therefore probably, at least in part, due to methionine contained in them. In keeping with these observations, cortisone desensitisation on diet 18A shows significantly less variation than on diet 18, owing to uniform hypersensitivity among the controls. The possible implications of this protein-cortisone antagonism are discussed.

Methods

As in earlier work (Long et al. 1951a), large-scale factorial experiments were used to investigate the many possible interactions between cabbage, ascorbic acid, cortisone, skimmed milk, methionine, and ethionine. Once the nature of the processes involved became clear, simple and direct experiments were substituted. The design of experiments is indicated in the accompanying table and figs. 1–4.

Groups of ten albino guineapigs of the Hampstead strain, weighing 350–550 g., were fed either on Bruce and Parkes's (1947) pelleted diet 18, or else on the modified diet 18A, with or without unlimited cabbage, as indicated in each experiment ; they were injected with B.C.G. vaccine, and sensitivity to tuberculin was estimated by the method of Long and Miles (1950).

Cortisone acetate (5 mg. per kg. of body-weight) was suspended in 1 ml. of physiological saline solution and injected six hours before the tuberculin. Ethionine (50 mg. per kg. of body-weight) was dissolved in physiological saline solution and injected intraperitoneally at the time intervals stated in each experiment. Reduced glutathione (150 mg. per kg. of body-weight) dissolved in gas-free distilled water and adjusted with sodium-bicarbonate solution to pH 6 was injected intraperitoneally two hours before the tuberculin. Ascorbic acid (50 mg. per kg. of body-weight) was given by mouth three times a week. DL methionine (about 0·4 g. per kg. of body-weight) was supplied daily in the drinking-water.

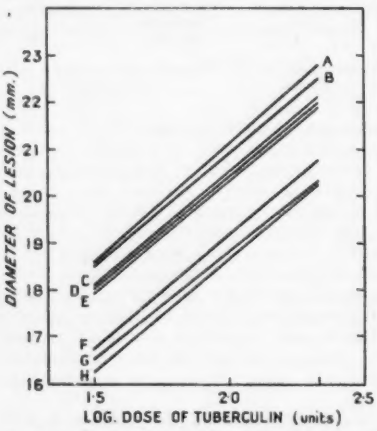


Fig. 1—Dose response to 32 and 320 i.u. of tuberculin in sensitive guineapigs : A, nil ; B, cabbage ; C, cabbage and ascorbic acid ; D, ascorbic acid ; E, cortisone ; F, ascorbic acid and cortisone ; G, cabbage, ascorbic acid, and cortisone ; H, cabbage and cortisone.

As in previous work, the diameter of the tuberculin lesions after twenty-four hours was proportional to the logarithm of the dose of tuberculin ; and it was possible to estimate the degree of sensitivity by the relative positions of the dosage-response lines fitted to the mean lesion-diameters plotted against the logarithm of the dose. Changes in sensitivity are measured in terms of the change in potency of standard doses of tuberculin compared with that in control guineapigs. Thus a potency ratio of 0·25 indicates a fourfold decrease in sensitivity. The probability that ratios differing from unity indicate a significant change in sensitivity is expressed by the value of P in the table ; ratios for which P is 0·05 or less are considered significant.

Results

CABBAGE/ASCORBIC-ACID/CORTISONE RELATIONSHIPS ON DIET 18A (ADDED PROTEIN)

Diet 18 is deficient in ascorbic acid (Bruce and Parkes 1947). However, for some unknown reason the batch of the modified diet 18A was so slightly deficient in ascorbic acid that guineapigs fed only on this diet showed no macroscopic evidence of ascorbic-acid deficiency even after four months. In experiment 1 (table and fig. 1) the control guineapigs had been on diet 18A for six weeks; so the term "ascorbic-acid deficiency " can scarcely be applied to them, and the significant slight depression in sensitivity induced by cortisone in guineapigs fed only on the basic diet may therefore be attributed to ascorbic acid (cf. Long et al. 1951a). Additional ascorbic acid had a similar slight effect in guineapigs both with and without additional cabbage. But ascorbic acid, ascorbic acid provided in cabbage, or ascorbic acid in addition to cabbage produced large and highly significant effects in the presence of cortisone. The outstanding difference between these findings and those obtained with diet 18 (cf. Long et al. 1951a) is the poor effect of ascorbic acid alone, which is restored by cortisone. Diet 18A therefore contains something absent from diet 18 that antagonises ascorbic-acid desensitisation, and this antagonism is relieved by cortisone. The conclusion is that skimmed milk antagonises desensitisation by ascorbic acid, and that this action in turn is antagonised by cortisone.

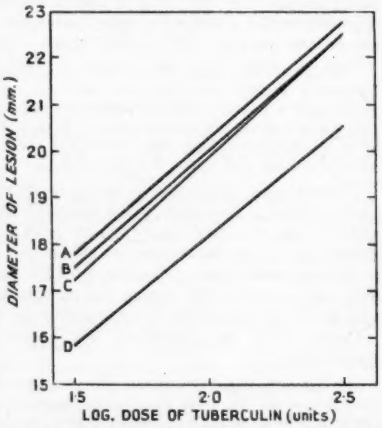


Fig. 2—Dose response to 32 and 320 i.u. of tuberculin in sensitive guineapigs : A, nil ; B, methionine ; C, methionine and ascorbic acid ; D, ascorbic acid.

ASCORBIC–ACID/METHIONINE RELATIONSHIPS ON DIET 18 (NO SKIMMED MILK)

Cabbage and skimmed milk are rich in the amino-acid methionine (Block and Bolling 1945), which assists synthesis of glutathione (Griffiths 1948a and b, Leaf and Neuberger 1947), which in turn antagonises desensitisa-

tion by cortisone or by ascorbic acid (Long et al. 1951a). The simple two-factor factorial experiment shown in fig. 2 was therefore carried out, statistical analysis confirming the methionine/ascorbic-acid interaction as highly significant. Methionine, like skimmed milk, therefore antagonises desensitisation by ascorbic acid in guineapigs on diet 18.

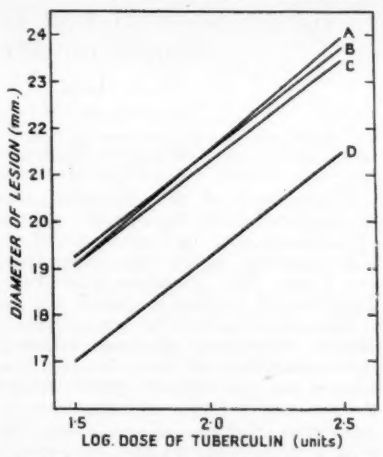


Fig. 3—Dose response to 32 and 320 i.u. of tuberculin in sensitive guineapigs: A, ethionine and glutathione; B, glutathione; C, nil; D, ethionine.

ETHIONINE/GLUTATHIONE RELATIONSHIPS ON DIET 18A AND CABBAGE (ADDED SKIMMED MILK)

Further evidence to support the idea of a methionine and ascorbic-acid antagonism is shown in fig. 3. Ethionine, an antimetabolite to methionine, had the opposite effect to methionine and skimmed milk, and allowed desensitisation by ascorbic acid present in cabbage to take place. This action was in turn inhibited by reduced glutathione. It is reasonable to postulate that ethionine interferes with glutathione synthesis and allows oxidation of ascorbic acid to induce desensitisation, this action being prevented by the injection of ready-formed reduced glutathione.

ETHIONINE IN GUINEAPIGS DEFICIENT IN ASCORBIC ACID ON DIET 18 (NO SKIMMED MILK)

Ethionine did not influence sensitivity in guineapigs on a diet deficient in ascorbic acid (fig. 4), showing that ascorbic acid is essential to its desensitising effect.

MISCELLANEOUS FINDINGS (DIET 18A AND CABBAGE)

Ethionine exerts its effect on tuberculin-sensitivity rapidly; it proved fully potent whether injected 0, 2, 4, or 6 hours before the tuberculin. Sensitivity was depressed by the same degree as that induced by cortisone, and the two substances neither increased nor opposed the action of the other.

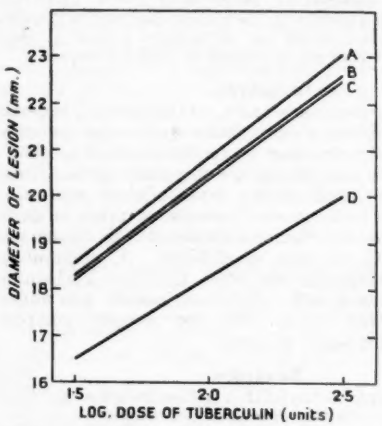


Fig. 4—Dose response to 32 and 320 i.u. of tuberculin in sensitive guineapigs: A, cabbage; B, nil; C, ethionine; D, cabbage and ethionine.

Discussion

The close analogy between the actions, in the tuberculin-sensitive guineapig, of cortisone and of alloxan has been repeatedly emphasised (Long et al. 1951c, Long 1951, 1952, Cornforth and Long 1952, 1953). The guineapig is remarkably resistant to the toxic actions of both; in particular, neither alloxan nor cortisone influences sensitivity in guineapigs deficient in ascorbic acid, and desensitisation by both is prevented by prior injection of reduced glutathione (Long et al. 1951c), of adenosine triphosphate, of insulin (Cornforth and Long 1953), and by administration of propylthiouracil (Long et al. 1951b and c).

The diabetogenic action of alloxan in sensitive species is increased by ascorbic acid, starvation, a low-protein diet, or a diet deficient in methionine or in cystine; all these factors decrease the non-protein—SH content of the tissues. Thyroidectomy, thiouracil administration, and injection of cysteine, glutathione, thioglycollic acid, or dimercaprol, all of which increase the non-protein—SH content of the tissues, protect against the diabetogenic action of alloxan (see Bailey 1949, Houssay 1950, Ogilvie 1952).

The findings reported here that cabbage protein, milk protein, and the amino-acid methionine antagonise desensitisation by ascorbic acid, and that ethionine has, like cortisone, the reverse effect, are in keeping with these observations and strengthen still further the analogy between the actions of alloxan and cortisone.

Alloxan readily produces diabetes in sensitive species, probably by reacting with tissue —SH groups; the β cells of the pancreas, being particularly susceptible, undergo necrosis (Ogilvie 1952). It is suggested that in resistant animals, such as the guineapig, small doses of alloxan react with tissue —SH groups, facilitating the oxidation of ascorbic acid to dehydro-ascorbic acid, which initiates desensitisation (Long et al. 1951c, Cornforth and Long 1953). The remarkable analogy between the actions of cortisone and those of alloxan suggests that, in the guineapig, cortisone also influences —SH groups to bring about desensitisation.

Support for this contention is available from other sources. Cortisone and hydrocortisone alone among the steroids have a profound effect on carbohydrate metabolism, increase serum-nitrogen and amino-acid levels, increase the excretion of amino-acids, nitrogen, and sulphur in the urine (Thorn et al. 1953), and alone depress sensitivity to tuberculin (Long and Spensley 1954). It has therefore been suggested (Long and Spensley 1954) that cortisone interferes with the anabolism of glutathione in the course of a general interference with protein synthesis, associated with an increased breakdown of sulphur-containing and other amino-acids. The resulting fall in the glutathione level facilitates the oxidation of ascorbic acid and leads to desensitisation (Cornforth and Long 1953).

The relationship of the thyroid gland to these effects of cortisone is noteworthy. Propylthiouracil prevents desensitisation by cortisone (Long et al. 1951b), whereas thyroxine in toxic doses increases hypersensitivity (Long and Miles 1950). At first sight it appears that both hypothyroidism and hyperthyroidism oppose the desensitising action of cortisone. Again the analogy with experimental diabetes is close. Thiouracil reduces the incidence of diabetes in rats subjected to partial pancreatectomy (Houssay et al. 1946); thyroid administration at first accelerates the appearance of diabetes and then cures it by inducing hyperplasia and hypertrophy of the islets (Houssay et al. 1946). Diabetes produced by this method is therefore improved by both hypothyroidism and hyperthyroidism. Houssay (1950) attributes the beneficial effect of hypothyroidism to an increase in the free —SH groups of the tissue, and that of hyperthyroidism to an increase in islet tissue associated with increased insulin output (Houssay et al. 1946). Insulin induces hypersensitivity in tuberculin-sensitive guineapigs (Corn-

forth and Long 1953). The influence of propylthiouracil and of thyroxine on tuberculin-sensitivity in guineapigs can therefore be readily explained in terms of the Houssay hypothesis.

Summary

Using the response to intradermal tuberculin as a measure of allergic hypersensitivity in albino guineapigs injected with B.C.G., it was found that:

(1) Skimmed milk antagonised desensitisation by ascorbic acid.

(2) Methionine antagonised desensitisation by ascorbic acid.

(3) Ethionine, an antimetabolite to methionine, antagonised the "cabbage factor" and skimmed milk, and allowed desensitisation by ascorbic acid to take place.

(4) Ethionine had no effect on sensitivity in guineapigs deficient in ascorbic acid.

(5) Reduced glutathione prevented desensitisation by ethionine.

The action of cabbage in antagonising desensitisation by ascorbic acid is almost certainly due to sulphur-containing amino-acids, probably methionine; cortisone antagonises this effect.

The close analogy between the actions of alloxan and of cortisone is reviewed in the light of the pharmacological actions of both. A simple hypothesis to explain the mode of action of cortisone in depressing sensitivity to tuberculin in the guineapig is that cortisone interferes with the anabolism of glutathione in the course of a general interference with protein synthesis, associated with an increased breakdown of sulphur-containing and other amino-acids; the resulting fall in glutathione facilitates the oxidation of ascorbic acid to dehydro-ascorbic acid, the latter inactivating phosphoglucomutase and increasing the concentration in the tissues of glucose-1-phosphate, which is intimately concerned with desensitisation (Cornforth and Long 1953).

I am indebted to Dr. Knud Tolderlund, of the State Serum Institute, Copenhagen, for the B.C.G.; to Dr. W. L. M. Perry and Miss M. V. Mussett for statistical analyses and advice on their interpretation. It is a pleasure to acknowledge the continued help and advice on all chemical aspects of this work of Mr. J. W. Cornforth, D.PHIL., F.R.S.

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"... The world to-day is full of 'educated' people who have little or no knowledge of the great new universe of the mind which has been created by the advancement of science over the last two or three centuries. They are living, in the political and artistic fields, in the twentieth century, while their mental picture of the physical world is not fundamentally different from that of the contemporaries of Shakespeare. Those of us to whom this situation causes fairly acute mental discomfort are aware that it is useless to demand that we shall 'understand' men who are working at the moving edge of knowledge with the immediate comprehension that any educated Victorian felt in listening to the controversy between Huxley and Bishop Wilberforce."—S. D. WINGATE, *The Times*, Jan. 15, 1954; p. 9.

SCREENING TEST FOR EXCESSIVE URINARY COPPER

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DESCRIPTION of the disordered copper metabolism in hepatolenticular degeneration (Wilson's disease) and of its modification by treatment with dimercaprol (BAL) and chelating agents (Cumings 1951, Denny-Brown and Porter 1951, Matthews et al. 1952, Zimdahl et al. 1953) has led to great interest in the condition.

The early stages of the more chronic types of Wilson's disease, which offer the most satisfactory response to the mobilisation of body copper, may exhibit only tremors and mild dystonia (Denny-Brown 1953). Usually the presence of Kayser-Fleischer rings is an unequivocal diagnostic criterion. Nevertheless there are cases of mild dystonia, particularly in young children, where estimation of copper is desirable as a diagnostic test.

An excessive amount of copper in the urine is a constant feature of all the cases which have been studied in this clinic. It has been found too where it has been looked for in other published cases of the disease, except case 4 of Cumings (1951), in which the excretion of copper never exceeded 200 μg. per twenty-four hours, which he accepts as within the normal range by his standards. The presence of excessive copper in the urine is therefore very helpful in the diagnosis.

The estimation of copper in the urine is tedious (Eden and Green 1940) and may require techniques and time not always available. It was felt therefore that a simpler procedure, though less exact, might be of value as a diagnostic screening test in suspected cases, especially in view of the very greatly increased amounts found in cases of undoubted Wilson's disease.

In this laboratory specimens of urine from patients with Wilson's disease have contained amounts of copper varying from 20·3 to 59·0 μg. per 100 ml. (by the method of Eden and Green). Normal urine by the same method has contained 1·48–4·9 μg. per 100 ml. Most of the published figures refer to the amount excreted in twenty-four hours, but Denny-Brown and Porter (1951) give figures of 18–54 μg. per 100 ml. Cumings (1951) reported 250–400 μg. of urinary copper per twenty-four hours in 3 out of 4 cases of Wilson's disease and 68–105 μg. per twenty-four hours in his controls. Porter (1951), using elaborate precautions against contamination, found a normal range of 0–14·7 μg. a day, and in Wilson's disease 207–713 μg. a day. Matthews et al. (1952) found that normal people excreted in twenty-four hours 10–68 μg. and their patients 415–970 μg. Over three-day periods Zimdahl et al. (1953) found 40–69 μg. of urinary copper in their controls, and 693–3360 μg. in 3 cases of Wilson's disease.

Technique

The screening method is based on the reaction between copper and sodium diethyl-dithio-carbamate followed by amyl-alcohol extraction as in the classical method; but evaporation and ashing are dispensed with. Amyl alcohol, however, will extract some urinary pigments; the extract from an unashed sample of urine is dark, and the detection of colour differences due to the copper dithio-carbamate complex is difficult. A preliminary extraction was therefore done before the dithio-carbamate reagent had been added. Dithio-carbamate was added to the extracted urine and the copper complex re-extracted with amyl alcohol.

Reagents

(1) 0·05% sodium-diethyl-dithio-carbamate solution.
(2) A saturated solution of ammonium citrate.
(3) Amyl alcohol.

Ammonium citrate, even of the highest grades obtained, commonly contains some copper. This should be removed

TABLE I—EXTRACTION OF DIETHYL-DITHIO-CARBAMATE-COPPER COMPLEX FROM URINE AND FROM WATER INTO AMYL ALCOHOL; EXTRACT FROM SOLUTION WITH NO ADDED COPPER AS THE BLANK IN EACH CASE. (KLETT-SUMMERSON COLORIMETER)

Urine		Water	
Copper added (μg.)	Colorimeter reading	Copper added (μg.)	Colorimeter reading
0	0	0	0
1	10	1	13
2	24	2	27
3	43	3	40
5	65	5	66

as follows: 5 ml. of diethyl-dithio-carbamate solution is added to 100 ml. of ammonium-citrate solution; 10 ml. of amyl alcohol is next added, and the mixture is shaken well and allowed to stand for separation to occur; the aqueous solution is drawn off and re-extracted with a further 10 ml. of amyl alcohol, and is then ready for use.

Method

All the glassware used must be cleaned carefully in nitric acid and washed with glass-distilled water. The samples of urine must be collected in glass vessels similarly cleaned. All the solutions are made up in glass-distilled water.

100 ml. of urine is well shaken with 20 ml. of amyl alcohol in a large separating funnel. The mixture is allowed to stand until the amyl-alcohol layer has separated, and two aliquots of 40 ml. of the aqueous layer are run into two smaller separating funnels. 2 ml. of ammonium-citrate solution is added. To one funnel 2 ml. of diethyl-dithio-carbamate solution is added drop by drop with constant shaking. 7 ml. of amyl alcohol is then added to both. The funnels are shaken for a minute and allowed to stand for 15 minutes. The amyl-alcohol layer (which is then not clear) is drawn off into a centrifuge tube, and the small amount of aqueous phase remaining is removed by centrifugation. 5 ml. of the clear amyl alcohol from each is then transferred by pipette to colorimeter cuvettes (cuvettes for the Klett-Summerson apparatus were used).

Results

Both the tubes will be found to contain a yellow amyl-alcohol extract, but in the presence of concentrations of copper, which we have found in the urine of patients with Wilson's disease (8·1–23·6 μg. per 40 ml. aliquot), the amyl-alcohol extract from the urine sample containing diethyl-dithio-carbamate is obviously much darker to the naked eye than the extract not containing the reagent. With the normal urines examined such difference is very hard to detect (they contain less than 2 μg. per 40 ml.).

Further experiments were made by adding known amounts of copper to urine, applying the procedure described above and estimating the colour in a Klett-Summerson colorimeter. The blue filter (400–465 mμ) was used, and the coloured extract to which no copper had been added was used as a blank. The colours obtained were compared with those found by extracting the copper complex from 40 ml. aliquots of distilled water in the same way and were found to correspond well. One such experiment gave the results shown in table I.

The method therefore can be made roughly quantitative if a known amount of copper—say 10 μg.—is added to another 40 ml. aliquot of amyl-alcohol-extracted urine and the colour of three final amyl-alcohol extracts is estimated. The readings obtained in two such experiments on urine containing much copper are shown in table II (20-ml. aliquots of urine were used).

TABLE II—ESTIMATION OF URINARY COPPER

Solution from which amyl-alcohol extract is prepared.	Amyl alcohol: colorimeter readings	
	Expt. I	Expt. II
Urine	0	0
Urine + diethyl-dithio-carbamate..	76	160
Urine + diethyl-dithio-carbamate + 5 μg. copper	145	—
Urine + diethyl-dithio-carbamate + 10 μg copper	—	280

In the first experiment the colour due to the added 5 μg. of copper is then equivalent to a reading of 145—76—i.e., 69. From this it may be calculated that the original sample (20 ml.) contained $\frac{76}{69} \times 5$ μg. of copper—i.e., 5·5 μg. Similarly the second experiment gives a copper content of 13·3 μg. of copper per 20 ml.

In Eden and Green's method the interfering effect of other metal ions, especially iron, is counteracted by the addition of ammonium citrate. In the present experiments ammonium citrate prevented interference by a solution of ferric chloride added to samples of urine.

Conclusion

It is suggested that this method for the detection and estimation of copper in urine may be of value where fuller facilities are not available. It may be useful, too, even where there are such facilities, since a negative result with this method is highly significant if colorimetry is used to check the colour difference and a standard is set up. In such circumstances it will enable the laboratory to pick out urines on which, for diagnostic purposes, a full copper estimation will be worth while. It should be emphasised that, if possible, this should be done on all samples of urine which by this method appear to contain excess copper.

Summary

A rapid screening procedure for estimation of increase in copper excretion in the urine has been devised on the basis of the Eden and Green method but omitting the tedious ashing process. The range of abnormal values in Wilson's disease is usually so greatly in excess of normal values as to make such a test of practical value in the clinic.

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GLUCAGON AND GLYCOGEN-STORAGE DISEASE OF THE LIVER

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GLYCOGEN-STORAGE disease of the liver was first described by von Gierke (1929), and its characteristic features have been progressively established by other observers, notably Van Creveld (1939, 1952), Bridge and Holt (1945) and the Coris (Cori 1952). It is a pathological entity quite distinct from several other diseases in which excessive glycogen is deposited in the liver and other organs.

The diagnosis is made in childhood by the finding of a considerably enlarged liver, and a diagnostic test is easily applied by the subcutaneous injection of adrenaline, which in the normal person accelerates the conversion of hepatic glycogen to glucose and causes hyperglycæmia, whereas in von Gierke's disease this does not happen. The test is simple, but, as Crawford (1946) observed, it is necessary to make sure that the adrenaline solution used is capable of producing hyperglycæmia; ward solutions are often impotent.

The metabolic consequences are hypoglycæmia, ketosis with consequent acidosis, retardation of growth, obesity, and hypercholesterolæmia. Either the hypoglycæmia or the acidosis may be severe enough to cause death

in young children, but amelioration takes place with growth, and these secondary results may be entirely corrected after puberty (Van Creveld 1952).

The ketosis and hypercholesterolæmia are explained by increased metabolism of fat. Bridge and Holt (1945) suggested that the obesity was caused by an abnormal conversion of carbohydrate to fat, and the retarded growth was due to impaired nitrogen retention associated with excessive gluconeogenesis from protein in an attempt to sustain the blood-sugar level during the night hours when ingested glucose is not available. Stetten and Boxer (1944) showed that only 3% of ingested carbohydrate is deposited as hepatic glycogen; so it is apparent that only a minor disturbance of daily carbohydrate metabolism is involved in glycogen-storage disease.

The major metabolic disturbances which result are due to the disappearance of the normal mechanism for maintenance of the blood-sugar level in hypoglycæmia. The formation of sugar from protein and the increased katabolism of fat are two of the body's final metabolic defences. The continued daily use of such desperate methods is especially harmful to children, in whom ketosis develops so easily (as in infections) and the need for protein in growth is paramount.

Much attention has been devoted to the nature of the metabolic fault in von Gierke's disease. Since the actions of glucagon, the hyperglycæmic-glycogenolytic factor from the alpha cells of the pancreas (de Duve 1953), have been understood, it has often been suggested that an absence of the glucagon might be responsible for the metabolic abnormality in glycogen-storage disease of the liver. Glucagon, prepared by the method of Staub et al. (1953), was therefore used in the following case of von Gierke's disease to determine whether there was any hyperglycæmic result from its intravenous injection.

Case-report

In a boy, now aged $7\frac{1}{2}$ years, the enlargement of the liver was first recognised at the age of 9 months. At the age of 6 years the diagnosis was made by liver biopsy. The liver was much enlarged, and histologically the biopsy specimen showed that the liver cells were about twice the normal size, with small central nuclei and a clear cytoplasm which gave the characteristic staining reactions for glycogen. The spleen was not enlarged. The boy's height was 41 inches at 6 years—5 inches below the average height for his age. He was moderately obese for his height, the fat deposit being mainly on his trunk and cheeks. His weight was 47 lb. against an average of 44 lb. at 6 years and an average of 37 lb. for his height of 41 inches. His fasting blood-sugar level was usually 50 mg. per 100 ml., and the characteristic blood-sugar curves and adrenaline-sensitivity are shown in fig. 1. There was ketonuria each morning, and the highest recorded blood-cholesterol level was 220 mg. per 100 ml. Liver-function tests gave normal results. Eight-day nitrogen balances showed that increased nitrogen retention could be achieved with a high-protein diet. During the succeeding

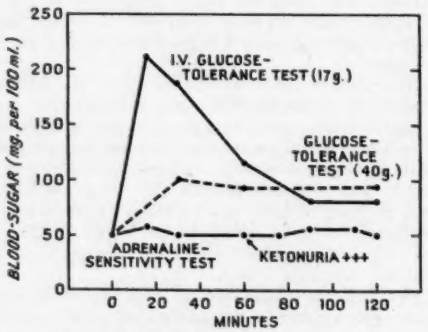

Fig. 1—Results of glucose-tolerance test, intravenous glucose-tolerance test, and adrenaline-sensitivity test in patient.

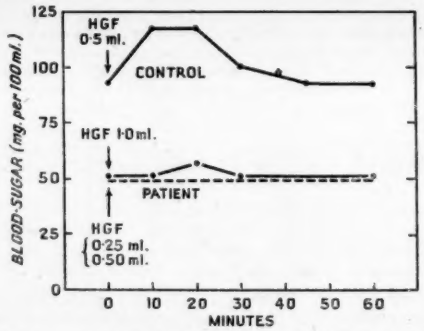

Fig. 2—Effects of intravenous HGF 0·2 ml. per 10 kg. of body-weight in control, and 0·1, 0·2, and 0·4 ml. per 10 kg. of body-weight in patient.

year he was given a diet of more than 3 g. of protein per kg. of body-weight, together with such nitrogen-retaining drugs as methyl-testosterone and androstenediol. His gain in height in this year was 3 inches—better than the average height increment at his age. Glucagon—'HGF' (Eli Lilly)—was given intravenously to several controls, and in fig. 2 is shown the smallest hyperglycæmic response obtained to 0·5 ml. of HGF in one of them. HGF was also given intravenously to the patient in doses of 0·25 ml., 0·5 ml., and 1·0 ml., and the responses obtained are also shown in fig. 2.

"1·0 ml. of HGF is equivalent to 2000 cat units, and 1 cat unit is that amount of material per kg. of cat which will raise its blood-sugar level 30 mg. per 100 ml. Optimal elevations of blood-sugar level have followed the administration of 20 cat units per kg." (Dr. W. R. Kirtley). The dose of HGF given to other controls represented 45 cat units per kg. of body-weight, and to the patient 20, 40, and 80 cat units per kg. of body-weight.

Discussion

It may be deduced from this failure to demonstrate any rise in blood-sugar level after the intravenous injection of glucagon in this patient that his inability to mobilise hepatic glycogen did not depend on the absence of the hyperglycæmic factor from the pancreas.

Cori (1952) and his colleagues showed that liver-phosphatase activity was practically absent in three cases of von Gierke's disease, and this enzyme is responsible in the normal liver for converting glucose-6-phosphate, the final step in the degradation of glycogen to glucose. The chemical structure of glycogen was apparently normal in eight of the cases examined (Larner et al. 1952), but in two other cases (Andersen 1952, Forbes 1953) the glycogen structure was abnormal. Mammalian glycogen is pictured as having a branched arboreal structure, and in Andersen's case it was thought that there was less than normal branching, with abnormally long inner and outer chains, and in Forbes's case the structure was abnormal in possessing very short outer chains. In this second case the action of the enzyme phosphorylase, which catalyses the first step in the degradation of glycogen to glucose-1-phosphate, was defective; yet phosphorylase action was normal in the cases of glycogen-storage disease examined by Larner et al.

Even in so rare a disorder as glycogen-storage disease more than one enzymatic defect is responsible. Glucagon increases the production of glucose by increasing the amount of active phosphorylase present in the liver cell (de Duve 1953). However, it seems improbable that an absence of glucagon will prove to be responsible for any form of glycogen-storage disease in the liver, because Thorn and Emerson (1950) and Ulstrom et al. (1952) have also reported a flat blood-glucose curve in one case of glycogen-storage disease after the injection of the hyperglycæmic-glycogenolytic principle. McQuarrie et al. (1950) have reported a familial type of hypoglycæmia

which is associated with a total, or almost total, absence of alpha cells in the pancreatic islets. An excess of glycogen is not deposited in the liver in this hypoglycæmic syndrome.

Conclusion

The intravenous injection of glucagon (HGF) did not raise the blood-sugar level in a child with glycogen-storage disease of the liver.

I am grateful to Dr. W. R. Kirtley, of Eli Lilly & Co. Ltd., for supplying the HGF used in this investigation.

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PRESERVATION OF CORNEAL GRAFTS BY FREEZING

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THE Corneal Grafting Act (1952) has simplified the legal aspects of obtaining corneæ for homografting in man, but difficulty often arises in obtaining suitable material at the precise time when it is needed. Present methods of storing corneal grafts have the common feature that the tissues are refrigerated above their freezing-point. This limits their storage life, and it is necessary to reject unused grafts after a few days. It is therefore difficult to build up a reserve or selection of grafts; each must be taken shortly before the operation for which it is intended. A further inconvenience is the necessity for cutting lamellar grafts either from the eye in situ on the cadaver or from the excised whole eye.

Many attempts have been made to store corneal grafts over long periods, and various methods have been tried in animals. Weiss and Taylor (1944), Katzin (1947), Leopold and Adler (1947), and Smelser and Ozanics (1946) all used rapid freezing in liquid nitrogen, with and without isopentane as an intermediate heat-transfer medium. In the method described in the first three of these papers the grafts after freezing were dried in vacuo over P_2O_5 at —40°C. They were reconstituted before use in most cases by the addition of isotonic sodium-chloride solution. Smelser and Ozanics did not dry their material but stored it at —195°C for periods of 1 hour up to 5 days. The grafts were then rapidly thawed by immersion in isotonic sodium-chloride solution at 39°C. When thus prepared for implantation, both the frozen and the freeze-dried grafts were found to be clear and of normal consistence and they handled well. Loosening of the epithelial layer was noticed after the thawing of the frozen cornea. The great majority of these grafts healed well after implantation, but in most of them translucency was lost within the first 3 weeks. No lasting transparency was demonstrated in a total of 106 animal operations.

We therefore considered the possibility of storing corneal grafts by freezing, using the glycerol-saline technique (Polge et al. 1949) which has been shown in other tissues to be compatible with a high percentage of surviving cells. We describe here the method which we have found to give satisfactory results in the preservation of human corneal tissue for grafting.

Method

The Donor

Cadaveric material has been used throughout this investigation. The material was obtained as soon as possible after death and never more than 12 hours later.

Graft-taking

A sterilised pack was kept ready in the hospital and contained: (1) eye speculum, (2) 2 pairs of fixation forceps, (3) Graefe knife, (4) large scalpel, (5) 2 bijou bottles, and (6) 2 sterile towels. The corneal material was taken under aseptic precautions. A lid speculum was inserted and the eye was irrigated with sterile normal saline. When taking corneæ for full-thickness grafts a Graefe section was made at the upper part of the cornea; the cut edge was grasped and raised with fixation forceps; and the knife was reversed to complete the incision below. Experience showed that it was difficult to cut a satisfactory lamellar graft from an excised cornea. A technique was evolved therefore in which the donor material was cut direct from the cadaver eye in situ. A rectus-muscle insertion was grasped by the forceps in the left hand to steady the eye. Using the large scalpel with a new blade in the right hand, and ensuring that both blade and cornea were wet, a lamella was shaved off the cornea. With practice a lamella some 0·5 mm. in thickness and involving some two-thirds of the area of the cornea could be obtained (fig. 1). Grafts of varying thickness are cut so that there is a selection available to meet the requirements of each particular case.

Lamellæ and full-thickness grafts were placed in sterile bijou bottles and were covered with an excess of 15% glycerol in Ringer saline (pH 6). After standing thus for 1 hour at room-temperature, most of the glycerol saline was decanted, leaving only just enough to cover the graft. The screw-cap was tightened as firmly as possible, and the bottles were immersed in a container of carbon dioxide and alcohol freezing mixture at —79°C. They were subsequently stored at this temperature after being transferred to a dry container. Both containers were kept surrounded with solid carbon dioxide, held in a lagged 'Perspex' box within a standard commercial deep-freeze. This apparatus has been described elsewhere (Eastcott 1953) as a convenient method for ensuring a constant low temperature for the preservation of frozen arterial grafts.

The storage-times for the 12 grafts which have been used up to the time of writing are shown in the accompanying table. Older grafts are now available for further trial.

Thawing was rapid in all cases. The bottle containing the frozen cornea was taken from the deep-freeze, immersed immediately in a water-bath at 40°C, and

removed as soon as the medium and its graft could be seen to have thawed. The medium was decanted, its pH was estimated with a Cambridge pH meter, and fresh sterile Ringer solution was substituted. The grafts were taken to the operating-room, and immediately before use the donor material was transferred to a normal saline solution contained 1000 units. of penicillin per ml.

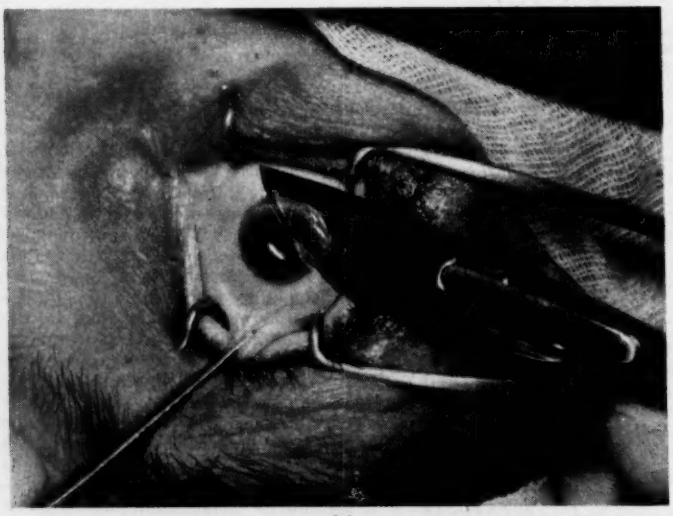
Operative Technique

After the donor material had been thawed the technique of grafting was the same as that with fresh material. The points of importance which we wish to emphasise are :

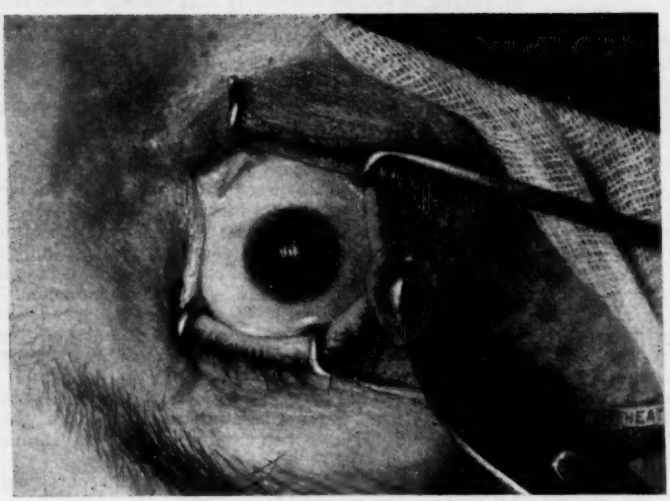
1. The grafts were cut by the punch technique, to sever the corneal fibres without distortion.

2. The recipient cornea was cut with the same trephine that had cut the donor cornea.

3. The graft was held in place by indirect sutures, for we consider that direct sutures between the graft and the recipient cornea cause unnecessary trauma to the graft. Only in the larger lamellar grafts did we use direct sutures.



(a)



(b)

Fig. 1—Method of taking lamellar corneal grafts from cadaver eye in situ.

Results

Physical Characteristics

Both lamellar and full-thickness grafts appeared normal in every way after thawing, except that loosening of the epithelium was noticed in 2 cases.

pH of Thawed Medium

This was found to vary between 4·0 and 6·2 (see table). The pH was unrelated to the duration of storage ; nor did the pH of the medium appear to influence the clinical result after grafting.

Operative Results

Lamellar grafts.—Of the 5 lamellar grafts used, all have remained clear up to 10 months after operation.

Full-thickness grafts.—7 full-thickness grafts were applied. In each of these cases effective union was obtained between the graft and the recipient cornea. The postoperative appearance of these grafts was similar, for they showed considerable opacification which was slow to disappear.

Of these grafts 1 (case 3, see table) became completely opaque ; the opacification progressed steadily until the graft was replaced by an opaque mass of fibrous tissue. Subsequently the eye was regrafted with fresh material and full vision was obtained.

Case 4 similarly became opaque and was successfully regrafted with fresh material. In this case the graft with frozen material was the second perforating graft applied to that eye ; the first graft (fresh material) had become opaque in the absence of any recognised postoperative complication.

In cases 10 and 11 the grafts used to replace the defect have remained clear, though in this position vision was not influenced.

Case 2 had improvement of her vision to 6/24 after grafting for corneal scarring due to interstitial keratitis.

Case 5 has a completely clear graft, and the patient is now awaiting a cataract extraction.

Case 12 has regained 6/6 unaided vision (fig. 2).

Discussion

All the lamellar grafts in this series have remained completely clear. Their post-operative behaviour differed in no respect from that of fresh material. The full-thickness grafts are less satisfactory ; for, despite complete success in 2 cases and partial success in 3 cases, these do not appear to behave in the same manner as grafts of fresh material. Considerable opacification was seen at the first dressing in all cases ; and this, even in the successful cases, took some time to clear. It was impossible to say in which cases complete clearing could be expected. It is likely that the freezing process, while not harming the substantia propria, even when this is cut relatively thick (0·5 mm.), does damage the more delicate endothelium so that the normal nutritional exchanges between the aqueous humour and the cornea are disturbed with resultant opacification of the graft. One of us (Leigh 1954) has recently shown that sudden opacification of a perforating graft can occur when the endothelium is obliterated by a growth of fibrous tissue over the posterior surface of the graft. It is also interesting to recall that in some of the frozen grafts a loosening of the epithelium was seen on thawing.

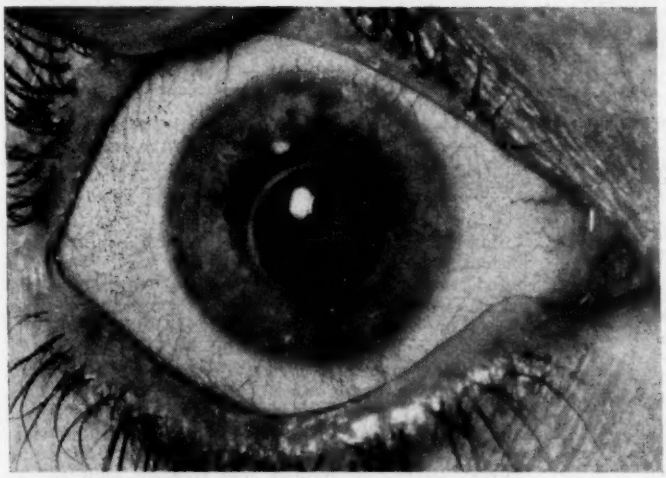


Fig. 2—Full-thickness corneal graft which has restored vision to 6/6 unaided.

In this hospital frozen corneal material is in routine use for lamellar grafts. Since the technique of obtaining this type of graft is simple and causes no mutilation of the cadaver a considerable quantity of lamellæ are at our disposal in the deep-freeze, and we have no difficulty in selecting a suitable lamella of requisite thickness for a particular case.

We are unable, however, to advocate the routine use of frozen full-thickness grafts. We are engaged in the study of the problem of opacification in these cases.

After homografting, cornea, in common with most other tissues, has been considered to be replaced by the recipient's tissues. It may be necessary to review this opinion in the light of recent observations. Firstly, no corneal graft has been shown to remain translucent after preservation by any method which would have killed its cells, although the tissue-proteins were otherwise fresh and undenatured. Freezing in glycerol solution is the only method known at present by which normal mammalian cells can be stored frozen for indefinite periods. It seems probable that this applies to the cornea, though direct proof has not yet been obtained. Secondly, if it be granted that a corneal graft should be alive at the time of transplantation, does it survive in the recipient? Green (1940) showed that the anterior chamber can maintain tissue-grafts from another individual, and Billingham and Boswell (1953) have found that homografts of split skin survive when placed on the cornea if vascularisation does not develop. These findings suggest that in man the glycerol-frozen corneal graft not only survives the processes of storage but also after a successful transplantation may remain alive in the recipient.

Summary

Partial-thickness corneal grafts stored at —79°C after immersion in 15% glycerol in Ringer's saline have been found to give results which equal those obtainable with fresh material.

It is also possible to obtain complete transparency in full-thickness corneal grafts stored in the same way. Further study is needed to determine and eliminate the causes of failure in this group.

It seems that by this method lamellar grafts can be stored indefinitely. Thus wastage is very greatly reduced.

We are indebted to Prof. W. D. Newcomb and to Prof. C. G. Rob for their help in providing facilities for the collection and banking of these grafts.

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DATA ON CASES AND GRAFTS

Case no.	Type of graft	Indications	Duration in freeze	pH of medium after thawing	Result
1	Lamellar	Corneal scarring. Preparation for full-thickness graft	3 days	5·8	Success
2	Penetrating	Corneal scarring due to interstitial keratitis	5 ,,	5·0	Partial success. Vision 6/24. Improving
3	,,	Corneal scarring due to interstitial keratitis	7 ,,	5·9	Failed
4	,,	Corneal scarring following ulceration	9 ,,	5·0	Failure. Graft tissue remained clear but developed membrane on posterior surface
5	,,	Central corneal opacity due to interstitial keratitis	16 ,,	5·8	Graft clear
6	,,	Central corneal opacities	16 ,,	5·8	Success. Vision 6/6
7	Lamellar	Trachoma scarring, in preparation for full-thickness graft	21 ,,	6·2	Success
8	,,	Corneal opacities following ulceration. Previous fresh graft failed to heal. Frozen lamellar substituted	28 ,,	—	,,
9	,,	Central corneal opacity following ulceration	37 ,,	5·5	,,
10	Penetrating	Rosacea keratitis with perforating ulcer, grafted as emergency. Pupillary area not involved	3 mos.	5·0	Partial success. Grafts healed well, retaining central clarity; some marginal scarring. Improving. Vision unaffected
11	,,	Rosacea keratitis with perforating ulcer, grafted as emergency. Pupillary area not involved	7 ,,	4·5	Partial success. Grafts healed well, retaining central clarity; some marginal scarring. Improving. Vision unaffected
12	Lamellar	Rosacea keratitis	9 ,,	4·0	Success

GANGRENE OF THE LEG FOLLOWING CARBON-MONOXIDE ASPHYXIA

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GANGRENE following exposure to carbon monoxide has been reported in 5 cases. A further case is described here.

Carbon monoxide is an asphyxiant, and the cases of gangrene following carbon-monoxide gassing fall into three groups :

(1) In 2 cases gangrene appeared to be due solely to the anoxic effect of the inhalation of carbon monoxide (McLean 1911, Briggs 1919). McLean's case was in a young man, aged 22, who had previously been fit. He was severely gassed and developed gangrene of both legs, requiring amputation. In the case described by Briggs fingers of both hands required amputation, and here also there was no evidence of any disease predisposing to gangrene.

(2) In 2 cases gangrene was due partly to anoxæmia resulting from the inhalation of carbon monoxide and partly to impairment of the blood-supply by the pressure of the inert body at those points where it was supported (Alberti 1884, Laignel-Lavastine and Alajouanine 1921). Owing to the positions in which they were lying, gangrene affected the right side of the neck, occiput, and scapula in Alberti's patient, and the right heel in Lavastine and Alajouanine's patient.

(3) In 2 cases gangrene was due to the combined effects of anoxæmia produced by carbon monoxide and of severe impairment of the blood-supply caused by arteriosclerosis. In the case described by Enzer and Spilberg (1946) there were no symptoms referable to an impaired circulation before asphyxia developed, but in the present case angina cruris had been a severe symptom and the carbon-monoxide gassing precipitated an event which might ultimately have been inevitable.

Case-report

A brewer's drayman, aged 58, was admitted to Bromley Hospital in November, 1951. He had been well until 1939, when he became depressed. In that year he was investigated in several hospitals, and in April, 1940, he was admitted as a voluntary patient to a mental hospital. He was discharged in 1942 and started work again within a week. He then remained well until 1947, when he noticed cramp-like pain in the right calf on walking, which would quickly subside on standing still. The angina cruris had become increasingly troublesome ; at first he could walk half a mile with no discomfort, but before admission it was felt after walking only twenty yards. A recurrence of his depression, three weeks before admission, culminated in an attempt at suicide by coal-gas. His wife had left the house for two and three-quarter hours and on her return found him with his head in the oven and the gas taps turned on. When seen by a doctor fifteen minutes later he was unconscious and cyanosed. His breathing was stertorous. He was admitted to hospital an hour later, when consciousness was returning. A sample of blood was taken, and spectroscopy confirmed the presence of carboxyhæmoglobin. Unfortunately the concentration of carbon monoxide was not estimated.

On admission it was noticed that the patient's right foot was cold and blue and his right dorsalis pedis artery just palpable. His temperature was 99°F, pulse-rate 80, and blood-pressure 150/80 mm. Hg. Gangrene of the right foot and lower leg developed, and amputation through the lower thigh was done nine days after the patient's exposure to carbon monoxide.

After operation he ran a high swinging temperature for a week and was treated with streptomycin. His general condition improved, and he was discharged at the beginning of February, 1952. His mental condition on discharge appeared to be normal, although the equanimity with which he had suffered the loss of a limb, offending him though it was, amounted to *la belle indifférence*. His mental condition deteriorated after leaving hospital, and he was readmitted under psychiatric care and later transferred to a mental hospital.

Pathology.—Gangrene involved the foot and lower leg. The femoral artery and its divisions showed gross atheroma and medial calcification. There was terminal blood-clot loosely attached to the endothelium at the lower end of the popliteal artery. Histological sections of the arteries showed gross degenerative arteriosclerosis with atheroma and medial calcification.

Discussion

Enzer and Spilberg (1946) made a very careful examination of the blood-vessels in a similar case. They also noted the formation of a terminal thrombus, and emphasised that the development of gangrene following closely on carbon-monoxide asphyxia could hardly be regarded as accidental or casual.

In other conditions terminal intravascular clotting, the result and not the cause of gangrene, develops. Thus gangrene may result from the ischæmia produced by the fall in blood-pressure in a severe case of cardiac infarction, and has been described in paroxysmal tachycardia (Levine 1951). A patient was recently admitted to Charing Cross Hospital with gangrene of the left hand and forearm. The gangrene resulted from the combined effects of severe anæmia and a pronounced fall in blood-pressure ; the latter was due to the toxæmia of bronchopneumonia. She died five days after the development of the gangrene, and terminal blood-clot was found in the axillary artery.

Although the blood-pressure falls in carbon-monoxide poisoning (Price 1950), there was no suggestion that gangrene had resulted from such a fall in the published cases of gangrene following carbon-monoxide asphyxia, and no such evidence in the present case.

It is now generally agreed that carbon monoxide causes death of tissue by asphyxia and has no histotoxic action. The asphyxia differs, however, from that caused by suffocation (Hamilton and Hardy 1949). Carbon monoxide has about 300 times as great an affinity for hæmoglobin as has oxygen, and is far more stable, and also the presence of carboxyhæmoglobin alters the oxygen-dissociation curve with the result that oxygen release at normal oxygen tissue pressures becomes grossly reduced. Lastly, liberation of carbon dioxide in the lungs and of oxygen in the tissues is facilitated by oxyhæmoglobin being more acid than reduced hæmoglobin, and this so-called Bohr effect is diminished by the loss of oxyhæmoglobin on its conversion to carboxyhæmoglobin.

Among other effects, changes in the central nervous system following carbon-monoxide asphyxia are well recognised (Lewin 1920, Wilson and Winkelman 1925), and carbon-monoxide asphyxia may cause mental change, including the development of an increasing psychosis (Quensel 1912, Strecker et al. 1927). The mental condition of the present patient deteriorated after his attempt at suicide, but it seems unlikely that this could be related to the exposure to carbon monoxide.

Although only 6 cases of gangrene following carbon-monoxide inhalation have been reported, probably many more have occurred. The causal relationship between the two events may not always have been recognised. Rabinowitz (1925), however, pointed out that the early development of gangrene in the form of bedsores is a diagnostic sign of carbon-monoxide gassing.

Carbon monoxide is not only the oldest of the industrial poisons but also still one of the commonest. Carbon-monoxide asphyxia occurs not only in industry but also in the home, where poisoning may be accidental or the result of attempted suicide. Sporadic cases are treated in every hospital in the country. The possible consequences of carbon-monoxide gassing should be well

known ; but, in the cases in which gangrene has been reported after exposure to carbon monoxide, this possibility was often not considered, even after symptoms of the impending catastrophe had developed. In the case described by Enzer and Spilberg (1946) the patient was complaining of numbness of the foot eighteen hours after exposure, but was discharged and readmitted two days later, only when the presence of gangrene was obvious. McLean's (1911) patient was discharged on the fifth day although complaining of pain in the feet and legs ; when he was readmitted two days later, both legs required amputation. In the case described by Briggs (1919) the development of gangrene was also missed, and the patient had to be readmitted.

If it is remembered that gangrene may be a sequel to carbon-monoxide asphyxia, appropriate measures may be taken to save the threatened limb. The complaint of pain in an extremity following carbon-monoxide asphyxia in the absence of any other cause suggests the development of gangrene. In this event the limb should be kept cool and vasodilatation effected by intra-arterial injection of tolazoline hydrochloride (' Priscol ') or by sympathetic block. Steps to increase the blood-supply to a limb temporarily threatened with gangrene after carbon-monoxide poisoning should not be delayed.

Summary

5 cases of gangrene following carbon-monoxide asphyxia are reviewed ; and a further case is reported.

If the possibility of gangrene, following carbon-monoxide asphyxia, is considered, treatment before irreversible changes have taken place may save a limb threatened by this disaster.

I am grateful to Dr. N. S. Plummer, under whose care this patient was admitted, for permission to publish this case, and for the help he has given me in preparing this paper.

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Reviews of Books

Lives of the Fellows of the Royal College of Surgeons 1930-1951

The late Sir D'ARCY POWER, K.B.E., F.R.C.S., and W. R. LE FANU, M.A., librarian. London : Published by the College. 1953. Pp. 889. 42*s*. To be had from the Editorial Secretary at the College.

Plarr's Lives of the Fellows appeared in two volumes in 1930. Its biographical notices of those who had held the fellowship since its foundation in 1842 were edited by D'Arcy Power from the collection compiled by Victor Plarr, librarian from 1897 to 1929. The new volume is a direct continuation and will be equally useful. The work was begun by Power on the principle of short memorial notices of complete accuracy and " no flowers by request." He wrote the lives of all who died between 1930 and October, 1940, giving up on his 85th birthday. The present librarian, Mr. Le Fanu, has proved himself the perfect successor.

There must be about a thousand biographies, ranging from those who served well and truly in general practice to men such as Moynihan, Crile, Arbuthnot Lane, the Mayo brothers, and Trotter whose names will not quickly cease to be household words. Each biography begins with a statistical section and most end with delightful personalia and a list of publications. A remarkable amount of information is compressed into a small space.

D'Arcy Power is appropriately given the longest notice. " Modest and unselfseeking, he carried his learning most lightly and always brought forward his assistants. Having been a poor man in early life, ' we married on £60,' he used to say, he remained always simple and approachable, and made no parade of his achievements. He was a very shrewd judge of men, absolutely straightforward and upright himself, with a puckish amusement at the foibles of others."

Bland-Sutton's Persian room is there. StClair Thomson " had a cat-like love of comfort and told against himself how, after a train accident near Lyons, he had refused assistance at Professor Léon Eugène Bérard's clinic, only to find himself, when the clinic was already full, more injured than he had thought and compelled to endure the rigours of the Salle des Blessés at the Hôtel-Dieu. In his last years he consciously paraded his valetudinarianism, and his death from the results of a street-accident was cruelly ironic."

D'Arcy McCrea " was a first class lawn tennis player and had represented Ireland in the Davis Cup Competition. His monograph on *Diseases of the Urethra and Penis* published six months before his death, was very well received. It was intended as the first of a series on the surgery of his special subject. The specimens and notes for this work, including a rich collection on the testicle, were destroyed in the bombing of his house in which he lost his life."

This book is notably inexpensive, thanks to a generous bequest for this special purpose from the late Prof. Grey Turner.

The Parietal Lobes

MACDONALD CRITCHLEY, M.D., F.R.C.P., physician, National Hospital for Nervous Diseases, Queen Square, London. London: Edward Arnold. 1953. Pp. 480. 70*s*.

IN medical and paramedical literature the name of Macdonald Critchley is associated with writing which combines lucidity of style and ingenuity of thought; and in his new monograph these two qualities are successfully applied to disease of the parietal lobes, of which he has wide experience. He is fully aware of the weakness of the conception of the parietal lobe as a distinct entity, and draws attention to the difficulties of exact topographical definition. The lobar concept of the brain is an empirical convention with obvious limitations, but the parcellative approach may be helpful in focusing attention on the problem of cerebral localisation or specialisation. The thematic limitations of the title of the book in no way detract from the wealth of anatomical, physiological, and clinical knowledge which it contains.

The opening chapters deal with anatomical and physiological considerations, and the anatomy is both pure and comparative (with a sidelong, possibly half-regretted, glance at Piltdown Man) and further embellished with a photographic portrait of an elephant's brain. A cool formalism, detectable in the early chapters, rapidly disappears as Dr. Critchley approaches disorders of the body image, constructional apraxia, and Gerstmann's syndrome, which he examines, fondles, and displays with thoughtful enthusiasm. Much of the long chapter on visual defects, discussed in relation to the connections between the parietal and occipital lobes, is frankly occipital in content, dealing with types of cortical blindness, metamorphopsia, and visual perseveration—the illusory reoccurrence of visual perception after the stimulus has been removed. Here again, however, the reader has the impression of a slight sense of unease, which once more disappears when Dr. Critchley turns to the problems of disorders of spatial and symbolic thought. His account of the relation of parietal symptoms to dementia and to hysteria, though a little inconclusive, emphasises the difficulties of these clinical problems. The work is rounded off with a summary, deceptively simple in its opening paragraphs, which expands into a supportive analysis of the Gestalt or configurational interpretation of clinical neurological problems.

The readers may dissent from some of the views expressed in this monograph, but they cannot fail to be interested, stimulated, and indeed entertained.

Cardioscopy

WILLIAM EVANS, M.D., F.R.C.P., physician, cardiac department, London Hospital. London: Butterworth. 1952. Pp. 143. 40*s*.

The title of this book implies that it records only what may be seen on fluoroscopy of the heart, but it is in fact a short textbook of radiology of the heart, and it is liberally illustrated with line drawings and radiographs. Many of the radiographs have been taken at a slow speed, presumably to measure the maximum transverse diameter of the heart. This inevitably results in blurring of the outlines of the cardiovascular shadow, which is particularly unfortunate when increased or decreased blood-flow through the lungs is being shown. The text is brief, lucid, and accurate, and so smoothly written that it makes the whole procedure appear easy. Dr. Evans clearly had the needs of postgraduate students of cardiology and radiology in mind when he wrote, and to them his book can be heartily recommended.

Structure of Human Personality

H. J. EYSENCK, PH.D., reader in psychology, University of London. London: Methuen. New York: John Wiley. 1953. Pp. 348. 37*s*. 6*d*.

THE subject is an engrossing one, to experts and to the generality alike. G. W. Allport wrote an urbane, wide-ranging conspectus which still stands at the head of American books on personality. Now Dr. Eysenck comes forward with a work which is by no means always urbane, nor, in comparison with Allport's, wide-ranging: but it has merits which make the reader wonder whether the absence of these qualities is much of a loss.

In his two previous books Dr. Eysenck has shown what a distinctive and fruitful approach he has to the enormous problems which personality offers. Here he enlarges his scope to take in all that he regards as factual in the available literature; but this leaves the philosophical, the psycho-analytical, and the religious conceptions of personality outside his regard. Much, however, is included, and much, weighed in the balance of his criticism, is not found wanting. The balance is strictly adjusted, for "to the writer it appears better to err in the direction of excess of critical rigour than in the opposite direction of eclectic acceptance of good and bad indiscriminately." Adhering to this principle, he has produced a clear, impressive account of findings that are well attested and objective. In his final chapter he urges that what is needed in this field is a mathematical model of personality organisation from which testable hypotheses can be derived, by appropriate use of the technique of factor analysis. Analysis is the keynote of his whole book, and it will be surprising to many readers unacquainted with this sort of analysis—so different from psycho-analysis—to see how potent and illuminating it can be.

Disease and its Conquest

G. T. HOLLIS, Hon. M.A. Oxfd, editor, Oxford Medical Publications. London: Oxford University Press. 1953. Pp. 163. 9*s*. 6*d*.

ONE always gets the impression that the Intelligent Layman is more of a reader than a writer. But here one of the species has taken to his pen with good reason and to good effect. In the 30 years which he has spent as editor of Oxford Medical Publications, helping doctors to write books for doctors, Mr. G. T. Hollis has gained an extraordinarily wide knowledge of medicine. In his own book he now shares this specialised experience with other laymen, and, as Dr. Maurice Davidson points out in his generous preface, he is able to offer his readers "something which could not have been supplied by the vast majority of qualified medical men."

A casual glance at the chapter headings—Tuberculosis, Malaria, Varicose Veins, Apoplexy, Peptic Ulcer, Epilepsy, and so forth—might suggest that here is yet another popular household reference book. But as Mr. Hollis candidly says at the beginning "No one will learn from it how to treat illness, though he will learn how illness is treated." In fact each of the diseases, or groups of diseases, selected for discussion has been carefully chosen to give Mr. Hollis an opportunity to slip unobtrusively from the particular to the general, to set out some principle of causation or treatment, or to describe, as a background to the abnormal, the normal function and structure of some system of the body. As a scholar he is occasionally distressed by the doctor's treatment of Latin. For instance, he sadly explains that shingles is a "corruption of the medical word *cingulus* which is itself bad Latin—as, I am sorry to say, much medical terminology is." But apart from these lapses he clearly has a high regard for his medical collaborators and many of them will find his book pleasant busman's reading.

Orthopädische Konstruktionen

Prof. Dr. FRANZ SCHEDE, Oldenburg. Stuttgart: Thieme. 1953. Pp. 98. D.M. 8.

THIS little book, one of a series produced under the title of "Work and Health" by the West German ministry of labour, is a profusely illustrated monograph by Professor Schede, embodying forty years' experience of all sorts of orthopædic apparatus and appliances. He says in the introduction that he has confined himself to the "constructions and methods" which he can call his own or for which at least he has produced the original idea; and, though the origin of many of the more familiar pieces of orthopædic apparatus is lost in the obscurity of the past, there is certainly ample evidence here of his mechanical ingenuity. Some of the methods he applies are rather frightening and would find no place in modern orthopædic clinics in this country; indeed the reader may begin to wonder whether the patient's skin on the Continent is more resistant than its counterpart here. But even though we may not agree with all Professor Schede's recommendations, he has produced a very interesting record of his many ideas, and makes a host of shrewd comments on their application.

Endocrine Treatment in General Practice

Editors: MAX A. GOLDZIEHER, M.D., and JOSEPH W. GOLDZIEHER, M.D. New York: Springer. London: Large, Maxwell & Springer. 1953. Pp. 474. £3 3*s*.

IT is clear from reading this book, if it was not abundantly clear before, that "general practice" does not mean the same thing in the United States of America as it does here. The endocrine treatment described in this volume ranges from the most orthodox replacement therapy, through the almost unlimited and consequently indiscriminate use of corticotrophin and cortisone, to the exhibition of gonadal hormones in conditions where their use is, to say the least, empirical. This does not mean that there is not a substantial amount of factual and accurate information buried within these pages, but the work as a whole constitutes a highly indigestible meal for anyone who is not already so well versed in the subject as scarcely to require its help.

Pharmacy and Medicine in Old Edinburgh (London: Pharmaceutical Press. 1953. Pp. 35. 2*s*. 6*d*.).—Some two-hundred-year-old prescriptions have lately been found in Edinburgh below the floor-boards of an attic during the demolition of an ancient house at Fisher's Close in the Lawnmarket which was probably once a druggist's shop. There was no prescription book and no copying of prescriptions, merely the original scraps of paper on a spike-file. In his booklet Mr. C. G. Drummond communicates to the reader his excitement at this find and describes how he traced the unfamiliar ingredients and identified, from the initials, the name and standing of many of the prescribers and their patients. But some teasers remain. Who, for instance, was Miss Annie Lindsay and why was she due for a dose of thirty-six grains of powdered ipecacuanha on the following morning?

Radiology of Bones and Joints (5th ed. London: J. & A. Churchill. 1953. Pp. 875. 90*s*.).—The new edition of this well-known volume follows the pattern of its predecessors. The first part describes abnormalities and diseases according to their situation; the second and smaller part discusses the pathology of bones and joints. Dr. J. F. Brailsford has omitted nothing of significance from the new material recorded since the war, and as a result his volume is now an encyclopædia rather than a textbook. The arrangement, with multiple cross-references, makes it difficult to find one's way about, but the result is well worth while. The quality of the illustrations and printing of this valuable work of reference has recovered from war-time restrictions and is now first-class.

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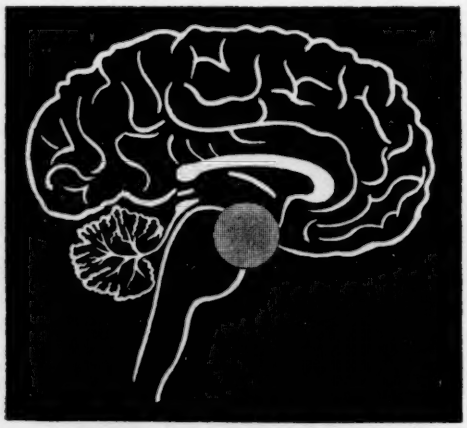

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THE LANCET
LONDON: SATURDAY, JAN. 30, 1954

Corneal Grafting

IN 1824 REISINGER [1] successfully applied a corneal graft in a rabbit. His contemporaries quickly appreciated the importance of this achievement, and in the succeeding years many surgeons investigated corneal grafting in man. They had little or no success, however, and its feasibility was doubted.[2] Interest was reawakened some thirty years later by VON HIPPEL,[3] who designed a clockwork trephine. His results with perforating grafts were unsatisfactory; but of 8 lamellar grafts 4 were successful. A little later FUCHS [4] and ZIRM [5] reported satisfactory results from penetrating grafts with homoplastic material. In the light of our present knowledge many of the early failures can be traced not only to the lack of suitable instruments, the absence of anæsthesia, and ignorance of the principles of asepsis, but also to ignorance of the biological difference between homoplasty and heteroplasty and the indiscriminate use of animal corneæ as donor material. As FRANCESCHETTI [6] points out, the evolution of keratoplasty was at this stage retarded by an unfortunate accident when VON HIPPEL, having observed panophthalmitis after homoplasty in man, reverted to heteroplasty. In 1911 MAGITOT [7] indicated the need for adhering to homoplasty; but up to 1930 only the schools of ELSCHNIG [8] and FILATOV [9] interested themselves in this work. The modern era of keratoplasty dates from ELSCHNIG's account of 1930 in which he recorded that some 20% of grafts had remained transparent, while a further 20% were translucent. About this time workers in other countries began to publish their results [10-12]; and since then the proportion of successes has steadily increased, owing to improvements in operative technique, the production of exquisite instruments (particularly trephines and corneal needles), antibiotics, and better understanding of the indications for operation.

Today corneal grafts are of two main types—penetrating and lamellar. In the penetrating graft a disc of the full thickness of the cornea is cut from the recipient eye and is replaced by a similar disc from the donor eye. This is essentially a sight-restoring operation, undertaken where opacification involves the deeper layers of the cornea. Lamellar grafting, which has been brilliantly developed by PAUFIQUE,[13] is now the accepted method where opacity is confined to the more superficial layers of the cornea. This form of grafting is indicated in such conditions as keratitis due to neurotropic viruses, hypopyon ulcer, acne rosacea, and dystrophic changes [13 14]; and it may also be used to close a corneal fistula, to replace tissue lost by the removal of a pterygium or symblepheron, or for cosmetic purposes. Such grafts are especially valuable, however, where the cornea is so opaque that a simple perforating graft would opacify. Here the application of lamellar grafts at intervals may result in the building up of a cornea of sufficient thickness and integrity to accept and maintain a perforating graft. In the early days of corneal grafting immediate restoration of some sight to a blind patient was commonly followed by gradual loss of vision over the next few weeks as the graft slowly became completely opaque. We now know that this unhappy sequence usually resulted from placing a graft in an unsuitable recipient cornea. When the whole area and thickness of the cornea are completely opaque there is no hope of success from a simple perforating graft. MCLEAN [15] suggests that at least half of the recipient cornea in contact with the graft must be normal, while LEIGH [16] considers that only a third need be normal. In competent hands corneal grafting is a safe and satisfactory operation; but the results are difficult to assess since they depend largely on the initial lesion. FRANCESCHETTI [6] reported that in a series of 500 cases 40% of the grafts remained clear; but including only cases in which success was regarded as likely before operation, the proportion was 75%. LISTER [17] points out that some 10–20% of cases are made worse by operation. This figure may seem alarming; but usually failure is assessed by opacification of the graft, which may be due to several causes. Among these a catastrophic complication leading to loss of the eye is rare; and thus many of the failures can be operated on again with every hope of success. CASTROVIEJO [18] records twelve such cases, of which eleven were successful.

The donor material is obtained from an excised eye or from the eye of a cadaver; as a rule the corneæ of the elderly are preferred to those of the very young. No incompatibility has yet been recognised, and BLUMENTHAL [19] has reported a successful graft from a Negro woman to a white girl. Heteroplastic material is never used in man, for this is replaced by opaque fibrous tissue. CHOYCE [20] has, however, reported successful heteroplastic transplantation in rabbits. A homograft of normal tissue (cornea to cornea excepted) between animals of mixed strain is slowly replaced by the invading cells of the host. This, as MEDAWAR [21] has shown, is due to an immune process; and the two animals must be very closely related genetically for homografts to survive in their original form. Homografts of normal or neoplastic tissue in the anterior chamber of the eye are an exception to this rule.[22 23] Whatever may be the fate of the graft in the recipient cornea

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2. Nottingham, J. On Conical Cornea. London, 1854; p. 193.
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6. Franceschetti, A. *Trans. ophthal. Soc. U.K.* 1949, **69**, 17.
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9. Filatov, V. P. *Ann. Oculist., Paris*, 1934, **171**, 721; *Lancet*, 1937, i, 1395.
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11. Castroviejo, R. *Proc. Mayo Clin.* 1931, **6**, 417.
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17. Lister, A. *Ophthal. Lit., Lond.* 1951, **5**, 67.
18. Castroviejo, R. *Int. Congr. Ophthal., Lond.* 1950, **2**, 1005.
19. Blumenthal, C. J. *S. Afr. med. J.* 1949, **23**, 840.
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22. Greene, H. S. N. *J. exp. Med.* 1941, **73**, 475.
23. Woodruff, M. F. A. *Ann. R. Coll. Surg. Engl.* 1952, **11**, 173.

in man—we still do not know whether the graft retains its identity as a living structure or whether it acts simply as a scaffolding into which grow the cells of the recipient cornea—a graft, to succeed, must be viable when implanted.[24] If the cornea is dead from formol fixation or presumably dead after unprotected freezing or freeze-drying or exposure to irradiation,[25] when applied as a graft it immediately becomes opaque and is replaced by fibrous tissue. PAUFIQUE recommends that the eye should be taken from the cadaver within three hours after death, but eyes removed after twenty-four hours have provided satisfactory donor material.[17] The material is best used at once; but usually this is impracticable, and the excised eye is kept in liquid paraffin at a temperature of 2–4°C until it is required. Donor material kept in this way has proved viable even after some weeks,[24] but the sooner after death the eye is removed the longer it remains viable.[26 27] Most surgeons prefer to use the donor cornea not more than a week after excision,[28] although RYCROFT [29] has reported successful results with material kept for three weeks.

In 1949 POLGE et al.[30] found that fowl spermatozoa treated with glycerol saline solution retained their motility after freezing and thawing. Such treatment has since been found to protect other tissues[31]; and now Mr. EASTCOTT and his colleagues report, on p. 237 of this issue, that human cornea so treated and stored at −79°C yields lamellar grafts that seem to differ in no way from fresh grafts; no opacification has been seen. Of seven perforating grafts two have remained perfectly clear and three reasonably clear. Thus it seems that material treated and stored in this way remains viable. The development of this method may greatly reduce the wastage of donor corneæ, the demand for which is steadily increasing. Stored material may also prove valuable when a graft is urgently needed for the treatment of a perforated corneal ulcer or a descemetocele.

Non-tuberculous Tuberculin Reactions

Dr. CARROLL PALMER, director of the W.H.O. Tuberculosis Research Office, holds that "the time has come . . . for wider consideration of the proposition that tuberculin sensitivity in human beings is very often not due to tuberculous infection." [32] It has long been believed that reactions to large intradermal doses of Old Tuberculin may not necessarily indicate tuberculous infection; and typical delayed reactions have followed injection of the medium used in its preparation.[33 34] Similar apparently non-tuberculous reactions have been obtained with purified protein derivative (P.P.D.),[35] although in this case the medium itself does not cause reactions.[34] The reactions have been attributed to causes other than acquired hypersensitivity to a particular agent, and hence have been termed "non-specific"; but sensitivity that is not due to *Mycobacterium tuberculosis* would be better described as "non-tuberculous," for the reactions could be due to specific sensitivity to other agents.

The pattern of tuberculin sensitivity in different populations has been investigated many times in terms of the proportions "positive" to different amounts of tuberculin. Lately the Public Health Service of the U.S.A. and the W.H.O. Tuberculosis Research Office have analysed this pattern more precisely by accurate measurement of the diameter of the indurated skin; and these studies have yielded interesting and unexpected information.

In Denmark, Mexico City, and many parts of the U.S.A.,[36–38] analysis of the size of the reactions to small doses of P.P.D. (5 or 10 T.U.) [39] shows that the population can be fairly sharply divided into two groups: a large one with no or very slight reactions (less than 4 mm.), and a small one with large reactions (greater than 10 mm.). Very few indeed have reactions between 4 and 10 mm. The large reactions are scattered around a mean lying between 10 and 20 mm., the frequency curve following closely the well-known shape of the normal probability distribution. Tuberculous patients show a different pattern, there being only a single group with reactions distributed normally about a similar mean.[40 41]

It is reasonable to infer that the general population in these areas consists of a group sensitised by infection with tubercle bacilli and of an unsensitised group. If those with only small reactions are tested with large doses of tuberculin (100 or 250 T.U.) the pattern is a little different. There is still a large proportion with very slight or no reaction, but there is no concentration of reactions above 10 mm., and the frequency distributions could be interpreted as a small group with a mean between 4 and 10 mm. merging into the great mass lying below 4 mm. With increasing age throughout childhood the group with large reactions to small doses increases, while that with very little or no reaction decreases; there is no apparent change in the very small proportion with small intermediate reactions.

These facts are consistent with the hypothesis that the sensitivity detected by P.P.D. is caused only by tuberculous infection, although the constant rarity of small reactions to small doses at all ages might be difficult to account for. If children pass through an intermediate level of sensitivity before becoming highly sensitive they must do so very rapidly. An alternative hypothesis is that tuberculous infection almost always causes an immediate high level of sensitivity, and that small reactions to small doses or reactions only to larger doses are in general independent of the increased exposure to tuberculosis with increasing age.

In Egypt, South India,[42] and the south-eastern States of the U.S.A.[32 38] a quite different pattern of sensitivity has been found.

In Egypt, for instance,[37] there was a large group with large reactions to small doses, but less than 5% with no reactions at all and a large concentration of reactions between 4 and 10 mm. With increasing age the group with large reactions increased, while that with small reactions decreased. Although the mean diameter of the small reactions increased with age, that of the large

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25. Duane, T. D., Lee, O. S. *Amer. J. Ophthal.* 1949, **32**, 671.
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37. Edwards, L. B., Palmer, C. E. *Ibid*, 1953, i, 53.
38. Palmer, C. E., Ferebee, S. H., Strange Petersen, O. *Publ. Hlth Rep., Wash.* 1950, **65**, 1111.
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reactions decreased. Furthermore, when those with no or slight reactions to 10 T.U. were tested with 100 T.U. very few still had no reaction, and the great majority still had reactions between 2 and 10 mm. If the sensitivity detected by P.P.D. is caused only by tuberculous infection a very large number of Egyptian children are infected at an early age, but the majority of them became only slightly sensitive. As they get older some became more sensitive, presumably by repeated infections; but the transition from low to high sensitivity seems to be as abrupt as that from insensitivity to high sensitivity in Denmark. There would thus be two distinct grades of sensitivity after infection by tubercle bacilli.

The prevalence of small reactions appears to be unrelated to the prevalence of large ones.

Thus, the frequency of large reactions to small doses was almost the same in the children examined in Mexico City and in Egypt, but in the former there were very few small reactions and in the latter very many. In the Madanapalle area of South India there were relatively few large reactions but a very large number of small ones. In the south-eastern States of the U.S.A. there were more small reactions than in the rest of the country, but almost the same number of large reactions. Small reactions were more common in urban areas, although the reverse was true of large reactions; and the difference was greatest in the south-eastern States.[38]

Nor does the prevalence of small reactions seem to be affected by the amount of pulmonary tuberculosis in the different countries.

In Denmark, for instance, where the prevalence of the disease is one of the smallest in the world, there are very few large or small reactions. But in Madanapalle, where there is also very little pulmonary tuberculosis and a low frequency of large reactions, there is a very high frequency of small reactions. Elsewhere in India, in a small mountainous area near Darjeeling, there are clear differences in the pattern of sensitivity between those living above 5000 feet and those below 3000 feet; but there is no reason to suppose that in this otherwise homogeneous population there is any great difference in the prevalence of pulmonary tuberculosis.[42] Further evidence comes from the large-scale investigations in the U.S.A.[32] More than 22,000 student nurses were tested with 5 T.U. and, if the reaction was less than 5 mm., with 250 T.U. Information about contact with tuberculous patients was obtained in each case. As expected, the proportion with reactions to 5 T.U. above 10 mm. was largest in the group with close contact and smallest in those without any known contact, the general pattern of sensitivity being the same in both groups. But the reactions to 250 T.U. showed no such difference, and response to the large dose of tuberculin was quite independent of contact. Although the pattern of sensitivity to the large doses in those who had lived in the south-eastern States differed from the pattern elsewhere, a history of contact had no effect on the pattern within each region.

PALMER and his colleagues postulate from these facts the existence of a type of response to tuberculin different from that caused by tuberculous infection. This non-tuberculous type seems to be independent of exposure to tuberculous patients and to be closely related to geographical situation. Racial differences alone cannot explain it, for there are clear differences in response within populations of the same race, as in North India [42] and the U.S.A.[32 38] It might be thought that, in view of the geographical distribution so far discovered, exposure to sunshine was a factor. Skin sensitivity is said to be decreased by ultraviolet light [43]; and climatic factors have been suggested as a cause of the differences between similar populations living in different localities in the fluctuation of skin sensitivity from year to year.[44] These differences might, however, be due to differences in the prevalence and fluctuation of non-tuberculous reactions.

PALMER [32] states that "the crux of the problem . . . is to explain how the same microorganism can, in the one instance, be transmitted by personal contact and produce first-dose sensitivity and, in the other, be transmitted in some different way and produce second-dose sensitivity." There is no difficulty in explaining how tuberculosis can be transmitted in two distinctly different ways. Man can be infected by tuberculous milk or by contact with people with pulmonary tuberculosis. The prevalence of disease due to bovine tubercle bacilli is not closely related to the prevalence of disease due to human bacilli. The prevalence of tuberculosis due to bovine bacilli varies with the number of diseased cattle in the region and the dietary habits of the population, whereas the prevalence of disease due to human bacilli varies with the number of people with pulmonary tuberculosis and the conditions under which they live. But to attribute "low-grade sensitivity" to infection by bovine bacilli it would be necessary to show that such infection produces smaller tuberculin reactions than infection by bacilli of human type, and that the prevalence of "low-grade sensitivity" varies with the prevalence of human disease due to bovine bacilli. There seems to be no evidence that in man infection with bovine bacilli causes a lower level of sensitivity to human-type tuberculin. Certainly in guineapigs there is little difference between the reactions to P.P.D. tuberculins prepared from human and from bovine strains.[45] It is true that cattle may be sensitised to human bacilli and give reactions that are variable and often small [46]; but human bacilli have very low virulence in cattle, in contrast to the high virulence of bovine bacilli in man. Too little is known about the incidence of human disease of bovine origin in different countries to relate this to the incidence of "low-grade sensitivity." There is no indication from the known incidence of tuberculosis in cattle in the U.S.A. that the students in the south-eastern States were more exposed to bovine bacilli than those elsewhere. But although it seems that the peculiar differences in the patterns of tuberculin sensitivity cannot be wholly attributed to bovine infection, it is doubtful whether this can entirely be eliminated as a contributory cause.

PALMER [32 38 42] suggests that the pattern of sensitivity to tuberculin is made up of two kinds of sensitivity —that brought about by infection with *M. tuberculosis* and that caused by an organism antigenically related to it. Tuberculin-sensitivity can be produced in animals by many acid-fast organisms, both pathogenic and non-pathogenic. The animals are more sensitive to tuberculins prepared from the infecting bacilli than to most of the tuberculins prepared from related organisms.[45 47 48] Tuberculin from *M. tuberculosis* may therefore give only small reactions in human beings sensitised by other bacilli or react only with much larger doses. Acid-fast bacilli are widely distributed in Nature,[49] and a type of sensitisation depending on the natural environment rather than diseases of man would account well for

43. Mayer, E. *Amer. Rev. Tuberc.* 1920, **4**, 100.
44. Aronson, J. D. *Ibid*, 1951, **63**, 121.
45. Green, H. H. *Vet. J.* 1946, **102**, 267.
46. Crawford, A. B. *J. Amer. vet. med. Ass.* 1936, **89**, 562.
47. Crawford, A. B. *Ibid*, 1926, **69**, 579.
48. Tarshis, M. S., Frisch, A. W. *Amer. Rev. Tuberc.* 1952, **65**, 302.
49. Haudurov, P. Inventaire et Description des Bacilles Paratuberculeux. Paris, 1946.

the little that is yet known of the distribution of non-tuberculous sensitivity. It may be possible to demonstrate non-tuberculous sensitivity in a population and to determine that it is more prevalent than tuberculous sensitivity; but it may be difficult to discover whether the reaction of an individual in such an area is due to tuberculous infection or not. Large reactions to low doses almost certainly indicate tuberculous sensitivity; while very small reactions to large doses almost certainly represent non-tuberculous sensitivity. But there must be a zone between these two extremes where, at present, the one cannot be distinguished from the other; and until precise sample surveys of a region have been made and the existence and prevalence of "low-grade sensitivity" discovered it is impossible to be certain that an isolated reaction is non-tuberculous. It would be interesting to know whether "low-grade sensitivity" exists in Great Britain. It can be detected best by measuring the reactions, but also by estimating the proportion of negative reactors to small doses who react to large doses. The extensive data of the Prophit Tuberculosis Survey [50] might provide some indication. For instance, differences were discovered between the reactions produced in nurses from England and from Ireland. Of the Irish girls negative to 1 T.U. 49% were positive to 10 or 100 T.U., compared with 66% of English girls, although the proportion positive to 1 T.U. or less was about the same. It was suggested that the difference might be due to racial factors; but it could possibly indicate more non-tuberculous sensitivity in the particular groups in England than in Ireland. In a recent survey [51] the proportions positive to the large and the small doses varied considerably between the different regions. This variation was attributed to differences in the reading of the reactions, for it appeared greater than could be expected from true differences in levels of sensitivity. Tuberculin skin reactions are indeed often very difficult to measure accurately. But some of the variation may have been due to differences in the pattern of sensitivity. The consistent results obtained by the W.H.O. teams in many parts of the world indicate that practised observers using precise methods can get more out of the tuberculin reaction than has previously been thought possible.

In many B.C.G. vaccination programmes prevaccination reactions to a small dose of tuberculin are separated at 5 or 6 mm. In areas with little non-tuberculous sensitivity a change to 10 mm. would make little difference to the numbers of children regarded as already infected with *M. tuberculosis*. But in countries where large numbers have reactions between 4 and 10 mm. it would have considerable effect; in Egypt, for example, it would decrease the number considered "positive" from 50 to 30% and increase those to be vaccinated from 50 to 70%.[37] The prevalence of tuberculosis in particular regions has been determined by finding the proportion of positive reactors to tuberculin at different ages. In countries such as Denmark this probably gives a reasonably correct guide; but in other areas it may grossly overestimate the prevalence of tuberculosis. Thus, for accuracy in epidemiological surveys and for efficient B.C.G. campaigns it is essential to investigate the existence and prevalence of non-tuberculous reactions in the area. In Great Britain non-tuberculous sensitivity, if it is present at all, is perhaps no more prevalent than in Denmark; but the position may be different in the Colonies.

50. Tuberculosis in Young Adults. Prophit Tuberculosis Survey. London, 1948.
51. Medical Research Council *Lancet*, 1952, i, 775.

Muscular Dystrophy

HEREDITARY muscular dystrophy or myopathy is relatively rare, but in the U.S.A. parents of children with this disorder have formed an association to stimulate research into its ætiology and treatment. This association has published the proceedings of two conferences [1] held under its auspices. Possibly in the past too much attention has been paid to dividing muscular dystrophy into eponymously named minor groups largely based on the anatomical distribution of the muscle wasting and weakness. Whatever the reason for the varied distribution of the muscle involvement in different patients or in different families, the basic cause is probably the same. TYLER [2] and STEPHENS [3] have suggested simplifying the problem by recognising two major forms of the disease, apart from dystrophia myotonica. The first is childhood progressive muscular dystrophy, which is inherited as a sex-linked recessive and affects predominantly boys, in whom it becomes manifest about the age of 3–5; in this type pseudohypertrophy of some muscles is common and usually the patient's condition deteriorates rather rapidly. Their second type—facio-scapulo-humeral muscular dystrophy—is usually inherited as a dominant and affects both sexes equally; it starts in adolescence or early adult life and its course varies greatly; in some patients there is slow but relentless deterioration, while in others there is only slight disability for many years. In respect of hereditary muscular dystrophy, this simplified classification is valuable; but other muscle disorders often included under the name of myopathy or muscular dystrophy appear to have a different ætiology. MCEARCHERN [4] described a "menopausal" muscular dystrophy, occurring especially in women but occasionally in men in the late 40s and in the 50s, in which there is considerable weakness of the muscles of the shoulder and hip-girdles with little apparent wasting. The microscopic appearance of the affected muscles is characteristic and differs from that in the hereditary cases; and the condition of some patients is greatly improved by cortisone and to a lesser extent tocopherols. Muscular dystrophy also occasionally complicates hyperthyroidism,[5] and it may accompany bronchial carcinoma [6]; and a congenital and at times non-progressive type producing the clinical syndrome of amyotonia congenita is also recognised.[7]

The basic cause of hereditary muscular dystrophy is thought to be metabolic, but hitherto biochemical studies have not yielded much information. The only consistent abnormality is increased excretion of creatine with a low creatinine output, but this is also found in other conditions characterised by muscle

1. Proceedings of the First and Second Medical Conferences of the Muscular Dystrophy Association of America Inc. Edited by ADE T. MILHORAT. Published by the association, 39, Broadway, New York 6. 1953. Pp. 128.
2. Tyler, F. H. *Ibid*, p. 46.
3. Stephens, F. E. *Amer. J. Med.* 1953, **15**, 558.
4. Shy, C. M., McEarchern, D. *J. Neurol. Psychiat.* 1951, **14**, 101.
5. Thorn, G. W., Eder, H. A. *Amer. J. Med.* 1946, **1**, 583.
6. Henson, R. A. *Proc. R. Soc. Med.* 1953, **46**, 851. Anderson, H. J., Churchill-Davidson, H. C., Richardson, A. T. *Lancet*, 1953, ii, 1291.
7. Aldren Turner, J. W. *Brain*, 1949, **72**, 25.

wasting. In 1952 ORR and MINOT [8] demonstrated *d*-ribose in the urine of twenty-six patients with muscular dystrophy, and in some with dystrophia myotonica, but not in the urine of patients with muscle wasting from other causes; and they suggested that this might be a specific and possibly important finding. MATTHEWS and SMITH,[9] however, have been unable to find this sugar in the urine of similar cases. DREYFUS [10] has found that the non-hæmin iron content of muscle was low in muscular dystrophy and high in disease of the lower motor neurone. He considers, however, that the reduction of non-hæmin iron in myopathic muscles results from the histological changes and is not due to a metabolic disturbance.

The treatment of hereditary muscular dystrophy remains unsatisfactory: vitamin E and vitamin B_6, which were at one time thought to be of value, have no specific beneficial effect.[11] In twenty-seven cases of patients aged 6–20, ABRAMSON and ROGOFF [12] applied intensive physiotherapy consisting in active and resisted exercises within the limits of fatigue, prevention of contractures by slow and persistent stretching of shortened muscles and appropriate splintage, and "functional movements" with the aid of slings and self-help gadgets. The condition of about half this group was improved; and improvement was most notable in the first two months or so of treatment.

Annotations

MESSAGE TO CONGRESS

ON Jan. 18 President Eisenhower submitted to Congress his proposals for improving the health of the American people.[13] After reviewing the progress of the past fifty years, and praising the team-work which has made this possible, he dealt with the main problems remaining to be tackled—cancer, cardiovascular diseases, rheumatism, blindness, diabetes, mental illness, and the lack of facilities for the rehabilitation of the disabled. "Two of the key problems in the field of health today," he said, "are the distribution of medical facilities and the costs of medical care." Doctors are unevenly distributed throughout the States, and so also are hospitals, while the costs of medical care are often a serious burden. "The total private medical bill of the nation now exceeds $9,000,000,000 a year—an average of nearly $200 a family—and it is rising." While the principles of freedom, consent, and individual responsibility must be retained, and the socialisation of medicine rejected, there are certain national goals to be attained. One such goal is that the means for achieving good health should be accessible to all, regardless of location, occupation, age, race, creed, or financial status. Secondly, the results of research should be broadly applied for the benefit of every citizen.

Among specific proposals the President recommended that the Public Health Service should be strengthened in its research activities; more assistance should be given to the construction of non-profit hospitals for the chronic sick, of a simpler type than general hospitals; the construction of non-profit nursing homes and convalescent homes should be aided, so as to release beds in general hospitals for the acutely ill; and non-profit rehabilitation facilities for the disabled should be provided. He also proposed assistance for the construction of non-profit diagnostic or treatment centres for ambulatory patients, particularly in rural areas and small isolated communities. (In each of these four proposals, it will be noted, the words "non-profit" appear; and the suggestion is made that special funds should be made available to the States to help pay for surveys of their needs.) But the most interesting part of the President's message is what he said about means of meeting the cost of medical care. His proposal is that by a scheme of Federal reinsurance, private and non-profit health-insurance organisations should be encouraged to offer broader health protection to more families; this scheme would be launched with a capital fund of $25 million provided by the government, "to be retired from re-insurance fees."

The idea of Federal reinsurance of private prepayment schemes is not a new one: it was considered by the Magnuson Commission [14] as a means of enabling these to expand, and to protect them from financial catastrophe by guaranteeing to meet any liability exceeding a certain maximum. What is new is the acceptance of the principle of prepaid health services as the most feasible method of financing medical care, with Federal funds used as a protection against the risks of financial failure through making the cover too wide. With this encouragement health-insurance plans, and particularly hospital insurance which is said to meet about 40% of all private expenditure on hospital care, is likely to expand further. This recommendation, together with the President's proposal to simplify Federal grants-in-aid programmes to the States, shows clearly that the government's intention of putting into effect "new methods of achieving better health for all of our people" is to be taken seriously.

DIAGNOSIS OF AMŒBIASIS

THE diagnosis of amœbiasis depends on the identification of amœbæ or cysts of *Entamœba histolytica* in the fæces. In fresh specimens the distinction of *E. histolytica* from other intestinal amœbæ such as *E. coli* is easy if the organisms are fairly numerous. Identification is more difficult if the amœbæ or cysts are few, or if the amœbæ have degenerated in the interval between the passing of the fæces and examination in the laboratory.

In view of these difficulties, techniques have been evolved to facilitate diagnosis. Beemer [15] and Sapero and Lawless [16] have devised staining methods which differentiate the trophozoites and cysts of intestinal amœbæ from fæcal detritus; and these methods also reveal the nuclear structure. When only small numbers of *E. histolytica* are present in the fæces, culture and concentration of the cysts by flotation increase the chances of detection. A complement-fixation technique devised by Craig [17] has not proved satisfactory for routine use.

Goldman [18] has described another serological method. The globulin fraction of an antiserum produced by inoculating rabbits with amœbæ and cysts of *E. histolytica* is conjugated with a fluorescein derivative. This conjugate reacts with methanol-killed *E. histolytica* amœbæ and cysts, which become fluorescent. The anti-*E. histolytica* conjugate reacts to a lesser degree with *E. coli*, but after the cross-reaction has been absorbed by amœbæ of *E. coli* the resulting conjugate gives fluorescence only with *E. histolytica*. Goldman

8. Orr, W. F., Minot, A. S. *Arch. Neurol. Psychiat.* 1952, **67**, 483.
9. Matthews, W. B., Smith, M. J. H. *J. Neurol. Psychiat.* 1953, **16**, 184.
10. Dreyfus, J. C. Footnote 1, p. 16.
11. Fitzgerald, G., McArdle, B. *Brain*, 1941, **64**, 19.
12. Abramson, A. S., Rogoff, J. Footnote 1, p. 123.
13. *New York Times*, Jan. 19 1954.
14. Building America's Health. A Report to the President by the President's Commission on the Health Needs of the Nation. 1952. Vol. I, p. 46. See *Lancet*, 1953, i, 388.
15. Beemer, A. M. *S. Afr. med. J.* 1947, **21**, 550.
16. Sapero, J. J., Lawless, D. K. *Amer. J. trop. Med. Hyg.* 1953, **2**, 613.
17. Craig, C. F. *Amer. J. trop. Med.* 1929, **9**, 277.
18. Goldman, M. *Amer J. Hyg.* 1953, **58**, 319.

adds that an anti-*E. coli* conjugate which has now been prepared is more specific than that prepared with *E. histolytica*. Other amœbæ that may be found in fæces, such as *Dientamœba fragilis* and *Endolimax nana*, do not react with the anti-*E. histolytica* conjugate; but other protozoa, including the small race of *E. histolytica*, have not been investigated with this technique.

Although still in the experimental stage, Goldman's method gives promise of an entirely new method of detecting and identifying *E. histolytica*. Since the criterion is the presence or absence of fluorescence, the test could be done by relatively untrained staff. Even where amœbæ or cysts are very scanty, the fluorescence from these should make identification certain, provided that the fæces contain no other fluorescent material.

THE TEMPORAL-LOBE EPILEPSIES

IN the past few years a group of epileptic disturbances has been recognised in which the site of abnormality is the temporal lobe or a closely related area. This group has been rather loosely termed "the temporal-lobe epilepsies." The clinical attacks, although varying in detail, have enough in common to suggest the diagnosis; and this may be confirmed by electro-encephalography (E.E.G.), which shows a local or focal abnormality in temporal leads.

The clinical picture includes attacks with a pronounced visceral or vasomotor aura or content; and the group embraces many of the cases with automatism (apart from the postictal ones), and those with Jackson's "dreamy" or "intellectual" aura, the *déjà vu* phenomenon, and psychomotor disturbances. It includes also a large proportion of the difficult so-called "epileptic" personalities and probably some of the strikingly episodic behaviour abnormalities of childhood. In addition to these "local signs" of the site of discharge, there may be frank grand-mal attacks. Despite these pleomorphic symptoms however, automatism, visceral or vasomotor features, and clouding (rather than complete loss) of consciousness are often distinguishing features of the group. The E.E.G. may show a focal spike discharge from one or other temporal lobe. However, a localised abnormality, especially if paroxysmal, or even a bilateral abnormality confined to the temporal areas, is of some value as a clue to a focus. This may be defined by placing electrodes as near as possible to the temporal lobes. They may be introduced into the nasopharynx, or needle electrodes may be inserted, as for a trigeminal-root injection, against the base of the temporal fossa. The focus may also be sought by enhancing or provoking a local electrical abnormality. Of these "provocation techniques" one of the most useful is recording during sleep induced by quinalbarbitone ('Seconal'); at this time a local discharge or even a clear-cut spike focus, which was hidden in the general activity of the wakeful cortex, may emerge.

The discovery of a focal abnormality is valuable not only in diagnosis but in planning treatment. These epilepsies often respond poorly to the usual anticonvulsants; and the personality sometimes associated with them may make general management difficult. They are therefore especially open to consideration for surgical excision if some clearly defined focus can be found in an area whose function can be sacrificed with impunity. With operation, of course, such a focus can be defined more precisely by recording directly from the dura or the surface of the cortex itself. In treatment, excision of the anterior parts of the temporal lobes has been practised in America,[1 2] in this country,[3] and in France.[4] In assessing this treatment it is necessary to consider both change in frequency of actual attacks and any alterations in the associated mental and personality traits. Of the 20 French cases recently reported, 16 had been followed for $^1/_2$–$2^1/_2$ years; of these 16, 9 had their attacks abolished, 2 had only minor attacks post-operatively, and 5 still had attacks and were classed as therapeutic failures even if the frequency of attacks was reduced. Mental changes are only briefly mentioned, but some general improvement is claimed. Judging by other series, it seems that reduction in epileptic attacks is more satisfactory and consistent than is any improvement in personality or conduct: but here opinion is still divided.

In this field enthusiasm should be tempered with caution until prolonged follow-up studies have been published. Before the recording of cerebral electrical activity was possible, elevation of depressed bone, freeing of dural adhesions, and excision of brain scars were all used—and with effect—in abolishing epileptic attacks, for a time. After three or four years, however, relapses were increasingly frequent. A similar trend is already apparent where cortical excision has been based on abnormal electrical discharge. Possibly in temporal-lobe epilepsy, which is notoriously unresponsive to medical treatment, the reasonable chance of controlling fits even for a few years would, in a severely disabled person, justify a major cerebral operation, especially if improvement in conduct and behaviour was also to be expected. No adverse consequences have been reported, and the procedure undoubtedly calls for further trial; but for its final assessment, especially if it is to be applied to the young, the follow-up should be considered in terms of a decade rather than of six months or a year.

1. Penfield, W., Flanigin, H. *Arch. Neurol. Psychiat.* 1950, **64**, 491.
2. Bailey, P., Gibbs, F. A. *J. Amer. med. Ass.* 1951, **145**, 365.
3. Hill, D., Falconer, M. A. *Proc. R. Soc. Med.* 1953, **46**, 965.
4. Petit-Dutaillis, D., et al. *Sem. Hôp. Paris*, 1953, **29**, 3838.

DIABETIC HEPATOMEGALY

The incidence of hepatomegaly in diabetics has received scant attention except in children, in whom the liver edge is much more easily felt. In adult as well as child diabetics, enlargement of the liver is commonest where the diabetes is poorly controlled, and of course patients reporting regularly at clinics are less likely to be poorly controlled than those not attending any clinic. Probably the most important reason, however, for failure to find hepatomegaly, even in unbalanced cases, is the difficulty of assessing liver size by palpation. It is notoriously difficult to feel a liver edge in obese or heavily muscled patients, and even if the edge is felt this may only mean that a normal-size liver is situated low, perhaps because of a flat diaphragm and emphysema. Goodman [1] emphasises that hepatomegaly is much more easily and more reliably assessed by measuring, with percussion, the distance between the upper and lower borders of the liver in the midclavicular line. The upper limit of normality for this distance he finds to be 7 cm. in women and 7·5 cm. in men; and he claims almost equal facility in measuring it in the obese and in the thin. In a series of 459 unselected diabetics, liver enlargement, judged in this way, was noted in 9% of those with well-controlled diabetes, in 60% of those with uncontrolled diabetes, and in each of the 10 patients with ketosis.

Early studies [2–5] of liver function in diabetes yielded no striking evidence of abnormality, but the tests were not particularly sensitive. Since then Gray et al.[6] have investigated the more sensitive serum colloidal-gold reaction in 247 diabetics. Their results parallel closely those of Goodman. Thus a positive colloidal-gold reaction was regarded as evidence of hepatic dysfunction

1. Goodman, J. I. *Ann. intern. Med.* 1953, **39**, 1077.
2. Diamond, J. S. *Amer. J. med. Sci.* 1928, **176**, 321.
3. Meyer, E. L. *Arch. intern. med.* 1931, **47**, 182.
4. Rabinowitch, J. M. *Brit. J. exp. Path.* 1936, **17**, 249.
5. Marble, A., White, P., Bogan, I. K., Smith, R. M. *Arch. intern. Med.* 1938, **62**, 740.
6. Gray, S. J., Hook, W., Batty, J. L. *Ann. intern. Med.* 1946, **24**, 72.

in 36·8% of the 247 diabetics. As with hepatomegaly, the colloidal-gold test was positive in a higher proportion of obese than of non-obese patients, but there was a more striking association between this reaction and the control of the diabetes. Just over 43% of diabetics receiving irregular care had a positive reaction, compared with 27% of those who were well supervised.

Before diabetes can be held responsible for the hepatomegaly in diabetes, other causes of liver enlargement must be excluded. Goodman [7] himself recognised two other causes. One was obesity, which he considered was seldom associated with more than moderate enlargement of the liver; and the other was deficiency of lipotropic agents, such as choline and methionine, as determined by the dietary history. He ascribed hepatomegaly to this hypothetical deficiency in 11 of 101 unselected diabetics; but this assumption is questionable. It was based presumably on the known incidence of fatty liver in depancreatised dogs maintained on insulin; but such dogs lack the exocrine secretion of the pancreas, which must be rare in human diabetes, and moreover the fatty liver can be restored to normal by feeding raw pancreas or lipotropic agents. Raw pancreas has in fact proved ineffective in reducing the hepatomegaly of 2 child diabetics; and betaine hydrochloride, a potent lipotropic agent, was definitely less effective (in 12 such cases) than was protamine zinc insulin (in 19).[8] White and her co-workers concluded from this study that hepatomegaly in diabetic children is usually due chiefly to poor control of the diabetes and not to a lack of choline or of some other agent derived from raw pancreas. In 60 diabetic children the association of hepatomegaly with other evidence of poor diabetic control was striking, and the attacks of abdominal pain to which they were prone were thought possibly to be due to stretching of the liver capsule.[8]

It has long been thought, mainly on circumstantial evidence, that in diabetics enlarged livers are fatty, although they may have a normal glycogen content; and this view has received more direct confirmation. Reinberg and Lipson [9] reported that of 102 diabetics who before death were in coma or ketosis, 51% were found at necropsy to have fatty livers. Fatty changes in diabetic livers have also been shown by aspiration biopsy,[10] but only in patients whose livers were proved to be insensitive to the effect of insulin in decreasing the hepatic glucose output. Such patients are typically middle-aged obese diabetics who rarely experience ketosis or hypoglycæmia. Young thin diabetics, who readily become ketotic or hypoglycæmic, show a good hepatic response to insulin except when ketotic, but even at this time the microscopic appearance of the liver is remarkably normal.

When diabetes coexists with a functionally deranged liver, there may be a significant interplay between the two conditions.[11] Not only will poor control of the diabetes tend to impair further the function of the liver, but reduced glycogenetic and glycogenolytic function of the liver will accentuate postprandial hyperglycæmia and tend to reduce the fasting blood-sugar level. But hepatomegaly in diabetes is perhaps chiefly important as an indication that the diabetes is being inadequately controlled [12]; and in diabetic clinics it would certainly be more valuable to record by percussion the distance between the upper and lower borders of liver dullness than to note only whether the liver is palpable.

7. Goodman, J. I. *Amer. J. dig. Dis.* 1951, **18**, 181.
8. White, P., Marble, A., Bogan, I. K., Smith, R. M. *Arch. intern. Med.* 1938, **62**, 751.
9. Reinberg, M. H., Lipson, M. *Ann. intern. Med.* 1950, **33**, 1195.
10. Bearn, A. G., Billing, B. H., Sherlock, S. *Lancet*, 1951, **ii**, 698.
11. Conn, J. W., Newburgh, L. H., Johnston, M. W., Sheldon, J. M. *Arch. intern. Med.* 1938, **62**, 765.
12. Leevy, C. M., Ryan, C. M., Fineberg, J. C. *Amer. J. Med.* 1950, **8**, 290.

SURGICAL TREATMENT OF ANGINA PECTORIS

SURGICAL endeavour in the treatment of angina pectoris has been of three types: (1) an attempt to improve cardiac blood-supply by anastomosis to the ventricle of alien tissue, such as pectoral muscle or omentum; (2) reduction of the demands on the heart by depressing the basal metabolic rate by means of thyroidectomy and thiouracil; and (3) interruption of the sympathetic cardiac nerves carrying pain sensation.

Hitherto the most usual, and probably the most effective, of these three approaches has been section of the pain pathways by cervicothoracic ganglionectomy. The stellate and cervical sympathetic ganglia were first removed for this disorder by Jonnesco [1] in 1921. The extent of the sympathectomy was later extended to include the stellate and the upper thoracic sympathetic ganglia on one or both sides, after it had been shown, both clinically and anatomically, that the afferent fibres from the heart run not only in the cervical cardiac nerves but also through the first four or five thoracic ganglia. This operation removes fairly successfully the oppressive rest or exercise pain of angina pectoris. Lindgren and Olivecrona [2] reported 71 cases of severe angina in which they had done a cervicothoracic ganglionectomy by the anterior approach. 6 patients died within a month of operation, but most of the remainder were freed from severe pain for months or years. Evans and Poppen [3] have obtained a satisfactory result in 13 out of 16 cases in which they did sympathetic resection by a transthoracic approach. They suggest that the operation should be confined to patients with severe angina associated with hypertension and normotensive patients with an "over-alarm" syndrome. After sympathectomy, which is usually staged for the right and left sides, the patient still recognises the "warning-signal" when he has gone beyond his exercise tolerance, but instead of the intense and frightening pain he has a sense of fullness or constriction or a mild ache. Occasionally the severe anginal pain migrates to the jaw or neck, which suggests that the pain afferent fibres run, not only in the sympathetic but also in the vagal and phrenic nerves.[4]

Although cervicothoracic sympathectomy usually results in bradycardia, it has been criticised because it may destroy the dilator fibres supplying the coronary vessels. Arnulf [5] has devised an operation which involves resection of the left second rib and removal by an extrapleural route of the superficial aortic plexus, which usually consists of five recognisable fibres. This, he claims, destroys all the autonomic fibres, including the parasympathetic vagal branches, which supply the base of the aorta, the left coronary artery, and probably the right coronary artery. Arnulf states that the operation is followed by tachycardia and a fall in blood-pressure, but that the main sequel is dilatation of the coronary vessels. The mechanisms of the vasomotor control of the coronary arteries are, however, confusing, and Lindgren and Olivecrona remark that clinical experience suggests that most of the vasoconstrictor fibres run in the sympathetic and not in the parasympathetic supply. Nor, if evidence from blood-flow in calf muscle is translated to the heart, would we expect a significant long-term increase in the blood-flow through atherosclerotic vessels from any denervating operation. Whether the Arnulf operation, which is an incomplete attack on the main cardiac plexus, should supersede the better-established cervicothoracic sympathectomy can only be judged by a careful follow-up of cases.

Experimentally Beck and Hahn [6] have adapted to the coronary circulation the technique of reversing blood-

1. Jonnesco, T. *Pr. méd.* 1921, **29**, 193.
2. Lindgren, I., Olivecrona, H. *J. Neurosurg.* 1947, **4**, 19.
3. Evans, J. A., Poppen, J. L. *New Engl. J. Med.* 1953, **249**, 791.
4. Mitchell, G. A. G. *Brit. Heart J.* 1953, **15**, 159.
5. Arnulf, G. *J. Chir., Paris*, 1950, **66**, 97.
6. Beck, C. S., Hahn, R. S. *Circulation*, 1952, **5**, 801.

flow so that it passes from the veins to the arteries—a method which many years ago had a short-lived vogue in the treatment of peripheral arterial disease. In animals these workers first established a free vein-graft between the aorta and the coronary sinus, and later partly ligated the coronary sinus near its ostium in the right ventricle. This they hoped would reverse blood-flow from the veins through the capillary network to the coronary arteries. They have shown in previously healthy dogs that thereafter a major coronary artery can be ligated with some freedom. It seems difficult to believe, however, that this extensive procedure will benefit the patient with atherosclerotic coronary disease.

As with many lesions due to degenerative vascular disease, surgeons have been bold, ingenious, and optimistic, even though their labours have so far yielded meagre dividends. Meanwhile most surgeons will continue to do unilateral or bilateral cervicothoracic ganglionectomy in selected cases of coronary-artery disease where the patient complains of severe pain and incapacitation and is unrelieved by conservative measures.

COMPARATIVE PSYCHIATRY

SCIENTIFIC understanding of mental illness has hitherto been derived mainly from the work of Western Europeans, whose personal experience has commonly been small groups. Kretschmer wrote his *Körperbau und Charakter* from study of about a hundred Swabians; and Freud, whose patients were mostly Viennese, would sometimes form a complex theory from observation of a single case. Generalisations about human nature and mental health, though valid for one society, may be inapplicable to other societies with different family forms and different beliefs and symbols. An œdipus complex in the son of a European family can hardly be the same as in the child of a polyandrous or polygamous family, or one where the child's relationships are with groups rather than individuals. Similarly observations on male homosexuality would no doubt differ greatly between tribes where this is tolerated or encouraged and societies where it is condemned. When the psychopathology of the peoples of India, China, Africa, Indonesia, and Polynesia has been studied we shall get a truer perspective on psychiatric problems, and by comparative studies be able to detect for each locality the cultural environmental factors which mould the expression of symptoms or lead to breakdown, and the common fundamental mechanisms.

The World Health Organisation has published a review [1] of the meagre information about psychiatry and psychology in Africa. This illustrates some of the difficulties of applying Western scientific methods to other cultures. To begin with, European medicine is suspect, and there are also all kinds of linguistic difficulties. Distances are big and communications poor, so many potential patients never reach a doctor. Witch-doctors and home care play a major rôle, and hospitals receive chiefly the unmanageable insane or the sick members of families under direct European influence—a reminder that the line between health and sickness is usually drawn by the patient or those around him. It is thus very difficult to ascertain the incidence of the different psychoses and neuroses or even the forms they take. It seems, however, that the incidence may be anything from a third to a tenth of that found in Britain or the U.S.A. Schizophrenia is the commonest psychosis; but usually it is of an amorphous type, and the classical European hebephrenic, katatonic, and paranoid forms are rare. Hysteria is very common. But upwards of 20% of all mental-hospital admissions cannot be placed in any standard Western category. This unclassifiable group is particularly great in rural Africans and less so in urban patients; in American Negroes the pattern is essentially like that in American whites, which suggests that increasing Westernisation creates the conditions for Western forms of mental ill health.

1. Carothers, J. C. The African Mind in Health and Disease: a study in ethnopsychiatry. World Health Organisation, monograph no. 17. H.M. Stationery Office. Pp. 178. 10s.

PROMOTION OF GROUP PRACTICE

AFTER the Danckwerts award, a Working Party set up to determine the distribution of remuneration among general practitioners recommended that money should be set aside for promoting the formation of group practices; the amount provisionally suggested was £100,000 per annum.[1] The Ministry of Health [2] announces this week arrangements for implementing the Working Party's proposal. Interest-free loans may be sought by practitioners who propose to form a group or who, having already formed a group, propose to provide new premises or substantially to improve their premises; the loans may be used to buy land and erect a new building, to buy and convert an existing building, or to convert a building owned by a member of the group. Applications for loans are to be made to the local executive council, which, in consultation with the local medical committee, will forward them to the Ministry with its comments. The Ministry will refer the application to a committee (the Group Practice Loans Committee), on which the medical profession and the Ministry will be represented, for a decision on whether, and how much, money shall be lent. The loans should be repaid, the Ministry suggests, normally over a period of ten years and certainly in not more than twenty years.

The Ministry does not say whether loans are to be restricted to the total of £100,000 per annum named by the Working Party. Such a sum can give no more than token encouragement to the growth of group practice. Dr. Collings,[3] estimates (conservatively, he thinks) that new buildings for this purpose will cost about £3000 per doctor, and the conversion of existing buildings about £1000 per doctor; and the modest joint surgery described on p. 255 of this issue has cost six partners some £10,000. This instance of private initiative holds a lesson that is worth noting. The partners embarked on it less from conviction of the virtues of group practice than because their separate surgeries were unsatisfactory. But in coming together in a single building they have automatically gained some of the advantages of those who deliberately form a group, including release from some of the non-medical work, better coördination, easier mutual consultation, and greater insight into each other's problems.

If, as we believe, the Minister is right in regarding group practice as "a valuable development," the Working Party's should not be the last word on the amount to be spent on it.

1. See *Lancet*, 1952, i, 1155.
2. F.C.L. 3 54.
3. Collings, J. S. *Lancet*, 1953, ii, 875.

Dr. H. F. MOORE, professor of medicine in the National University of Ireland at University College, Dublin, died on Jan. 25 at the age of 67.

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Special Articles

CONTROL OF CANCER MORTALITY

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THIS résumé provides an opportunity to pay tribute to all those who, twenty-five or more years ago, gave so liberally of themselves and their private means in an effort to achieve control of cancer mortality through early treatment. They deserve gratitude not only for their social concern and generosity but also for providing a vast experiment from which the efficacy of early treatment can be determined.

Apart from the organised control programmes, there have been, over the same years, many factors tending towards earlier treatment and more treatment: for example, the improved economic status of the people; the increasing use of the motor-car facilitating contact with the medical, and particularly specialist, services; an increase in admissions to hospital for investigation and care; a more ready acceptance of extensive investigation and treatment; and advances in diagnostic and therapeutic techniques and facilities. The effects of these changes might reasonably be expected to reinforce or supplement those of any organised programme of control.

Failure of Early Treatment to Reduce Mortality from Breast Cancer

Of all major cancers—i.e., those contributing relatively importantly to cancer mortality—breast cancer is the one most accessible for diagnosis and extensive treatment, and the one whose mortality records, because of their higher degree of uniformity and reliability, provide the best basis for comparison. These records are therefore the best for measuring the extent of control through early treatment.

Unfortunately, in the province of Ontario, the records of breast-cancer mortality do not show any decline in any age-group. On the contrary, they show the persistence of fairly level trends. The persistence of these level trends, in spite of many factors generally favourable to earlier treatment and in spite of a specific programme to that end, casts serious doubt on the feasibility of that means of control.

In Canada, the efforts at organised control have varied greatly from province to province. In Saskatchewan an aggressive programme was initiated about 1930 and developed so strongly that by 1944 full diagnostic and treatment services of all cancer without direct charge to the patient were provided. Attendance at government clinics increased to embarrassing numbers, and the proportion in whom no cancer was found increased to over half of those presenting: Watson and Beresford (1952) have reported "a marked increase in the percentage of early cases seen in government cancer clinics." In another province Blair (1947) reported that there was no active programme, no expanding clinic, and, apparently, no increase or speeding up in treatment. These provinces represent the two extremes of control, the other provinces varying between them. If earlier treatment were effectual in preventing death, there should be distinct differences between the breast-cancer age-specific mortality trends of the two extremes, and smaller differences between the trends of these and the other provinces. However, although their close definition is impossible because of wide and irregular fluctuations in the rates from small numbers, the trends appear to be the same in all—and level. In none is there any variation from others to suggest either the presence or the absence of an active control programme. Even those of the extremes are indistinguishable. The lack of any apparent difference between the trends of the two extremes, or of those of the other provinces in Canada, shows that earlier treatment, as practised, failed to achieve any appreciable control of breast-cancer mortality.

Since 1926 the Massachusetts Department of Public Health has had an active programme commonly conceded as, at least, one of the best. Through it, Lombard (1950) reports, "both the delay between first symptoms and the first consultation with a physician, and that between the first consultation and the visit to a clinic, have been reduced by one-half since the inauguration of the program," and, according to the Metropolitan Life Insurance Company (1949) "the proportion seeking medical attention within one month of first symptoms increased by more than half." In England complaints are sometimes made that there has been no programme of control comparable with that in Massachusetts or with others on this side of the Atlantic. However, although the rates derive from vastly different conditions, breast-cancer age-specific mortality trends in Massachusetts, in England and Wales, and in all of the Canadian provinces are practically identical and level. None gives assurance of any real decline. The persistence of *level* trends in the different circumstances is, in itself, an indication of reliability of these rates. Further, as it would be inconceivable that increases in the age-specific incidence of breast cancer would be confined to those areas where organised control was attempted, and would be proportional to the control efforts so as to offset them, the uniformity in the trends renders untenable any contention that there has been an increase in breast cancer, apart from that due to ageing of the population, in any of these areas. Thus, the uniform and level trends establish that, if early treatment prevented death in any cases, the number was too small in proportion to the whole of breast-cancer mortality in any age-group to make any decisive impression on the respective rates.

As failure of early treatment to control mortality is due to the development of remote metastases implanted earlier, the only logical hypothesis that can be formulated from the consistent failure shown by the records is that in most, if not all, lethal breast cancer remote spread takes place via the blood-stream before interference is practicable. Thus, according to this hypothesis, differences in neither time nor type of treatment of the local lesion with its regional or more extensive lymphatics could materially affect mortality. Evidence to the contrary must then be examined.

The Contrary Evidence and Its Fallibility

LIMITATIONS OF DIAGNOSIS INVALIDATE COMPARISONS OF DIFFERENT SERIES

Progressive increases in survival-rates in successive periods of time, and higher survival-rates in some series than in others treated at the same time, are commonly advanced as evidence of superiority of early treatment or of different treatment. Obviously, comparability of the two or more series compared is a prerequisite for valid deductions to be drawn from any difference in survival-rates.

It is pertinent in this connection that "among the cases operated upon by Halsted and originally classified as adenocarcinoma, some were subsequently reclassified as adenosis or Schimmelbusch's disease on restudy" (Geschickter 1943). And, as late as 1949, Urban and Adair reported that about 90% of pathologists present at a meeting about ten years before had diagnosed sclerosing adenosis as cancer. These workers also cautioned that the error was still being committed. It is evident, therefore, that differentiation between cancer and adenosis is not entirely free from confusion.

But this is perhaps not the most important limitation of histopathology. Bloodgood (1923), in the Halsted

Clinic, pointed out that, through the pressure of public "education," cases were presenting which differed from the previous cases, and that such cases elicited different diagnoses from different pathologists and were even then leading to a fictitious increase in survival-rates in some clinics. He pointed out, too, that the degree of fictitiousness in survival-rates would increase as the public and the profession became more cognisant and more apprehensive of all lumps in the breast; and he warned that neither the profession nor the public should be deceived thereby.

Lewis and Rienhoff (1932), in a critical analysis of the results of treatment in the same clinic, demonstrated clearly and incontrovertibly that, even in fully developed cancer, the biological nature—the metastatic or lethal propensity—cannot be discerned by microscopy with the certainty that was customarily accepted, and that what appears as cancer architecture under the microscope does not necessarily imply metastasising or lethal cancer. Grace, in 1941, long realising the need for better differentiation, initiated work in tissue-culture to that end. Today it is a safe generalisation that all competent cytologists and pathologists agree that, in histopathology, there is no sharp line dividing malignancy and non-malignancy. But, in practice, the division is made sharply, as it must be, in all cases presenting, and, naturally and unavoidably, with the diagnoses tending to the positive rather than the negative side. Though the pathologist may qualify his decision as one of opinion only, that qualification does not prevent the inclusion of the case as lethal cancer.

Grading and staging and combinations of these procedures, applicable only after the case has been diagnosed and treated as lethal breast cancer, are of some assistance in prognosis and in comparisons; but, as Scarff (1948) has emphasised, and Harrington's (1952) abundant data show, even these procedures do not differentiate between the presence and absence of lethal potentiality; even the group of grade 1 stage 1 contains some lethal cancers, indistinguishable from the others by histopathological examination, and some of these kill quickly, even though treated; and occasional unexpected survivals are found, in both the untreated and the treated, in most groups other than those in which remote metastasis is manifest.

All the efforts* now being made to obtain a sounder basis for prognosis through grouping, grading, staging, and their combinations, and through animal and egg inoculation and tissue-culture are, per se, a clear indication of limitations of histopathology and of the recognition of them by both clinicians and pathologists. These limitations, especially the inability to distinguish accurately between metastasising and non-metastasising cancers and between lethal and non-lethal cancers and also between different degrees of lethal potentiality in cancers, make it impossible to ensure for any two series the same distribution of lethal types. And different circumstances, in either time or place, make almost inevitably for difference in selection of cases. For instance, the more pressure "to get cancer early" and to consider every lump as cancer until proven otherwise, the greater is the variety of lesions presented for diagnosis. And, with the limitations of histopathology as they are, the greater the variety of lesions presenting, the greater is the proportion of false positives or non-lethal lesions showing or resembling cancer architecture to be unavoidably included for treatment as lethal cancer, and, consequently, the greater and more inevitable dissimilarity of different series.

Smithers (1952) and Smithers et al. (1952) have pointed specifically to other factors which commonly produce dissimilarity of different series and thus vitiate comparisons. The unavoidable inclusion of non-lethal types, largely but not exclusively as stage-1 cancers, to be noted later, not only renders the basis of calculation of survival-rates of lethal cancer fallacious but also, varying in its extent in both time and place, it makes inevitably for different degrees of fallacy. Thus, differences between survival-rates of different series, the comparability of which cannot be established and at best must be suspect, do not provide conclusive evidence of superiority of either early or different treatment.

* Unfortunately, as the host appears to play a part in determining the development or eradication of disseminated cancer cells, and as none of these procedures deals with host factor(s), there is some doubt whether they can provide a completely reliable prognosis or any certainty in separation of lethal from non-lethal types.

STAGE-1 CANCERS NOT NECESSARILY EARLY OR LETHAL CANCERS

High survival-rates in stage-1 cases (cases in which no axillary involvement has been found) are often advanced as another form of evidence of the value of early treatment or of treatment in an early stage of development. As stage-1 cancers are not of short duration but include all durations, some very long, survivals of stage-1 cancer are patently not evidence of the value of chronologically early treatment. The contention that high survival-rates in stage-1 cancer are evidence of the value of treatment of lethal cancer in an early stage of development is based on the assumption that all stage-1 cancers (so-called) would progress to axillary and remote lethal metastases if untreated. This assumption must be examined.

Though most clinics report increases over the years in the proportion that stage 1 forms of all cancers treated, changes in criteria and techniques and differences in completeness of classification vitiate comparisons and invalidate any precise estimate of the increase for any area. Nevertheless the recorded increases, considered with attendant circumstances, leave no doubt that in some places at least—e.g., Ontario and Saskatchewan—there have been real and substantial increases. Despite the increases, with reported 80–90% cures in these cases, the mortality-rates failed, as noted, to show any decline. This failure points to the inclusion of non-lethal tumours in the stage-1 increases.

Other evidence also points to the dubious character of some stage-1 cancers. Stage 1 ranges from about 15% to about 50% of all cases treated in various clinics. For instance, Richards et al. (1950) reported 16% in 921 cases, and Harrington (1952) 49·7% in 1476 cases. The wide difference between 16% and 49·7% calls for explanation. Neither of the reports gives the durations of the cancers; but, as the populations supplying the patients have been subjected to fairly similar cancer "education," there is no reason for assuming that the patients presenting at one clinic would include such a higher proportion of tumours of very short duration or in an early stage of development. If the difference between 16% and 49·7% were due to difference in detection of axillary involvement, a much higher proportion of the cancers in the 49·7% than in the 16% would be in reality undetected stage 2. In that event, the five-year survival-rate in the 49·7% stage-1 cases should be less, by all accounts, than in the 16% stage-1 cases. But it is not less; it is actually more—85·6% compared with 81%. Thus the difference between 16% and 49·7% cannot be attributed credibly to differences in detection of axillary involvement. By exclusion, then, much of the difference must be attributed to difference in selection of cases. This implies that the one series includes as stage-1 cancer types of lesions which have been largely, if not entirely, excluded from the other series as not being cancer. If the lesions so excluded from the latter series were progressive cancer, those patients would doubtless return later with their cancers developed to a more clearly recognisable state. However, there is nothing in the report of this series, or in other reports from this clinic, to suggest such return cases or errors in diagnosis. Thus, again by exclusion,

the only hypothesis which appears to be compatible with all the circumstances and free from incredible assumptions is that, whether or not the stage-1 cases forming 16% of treated cases include any non-progressive "cancers," the stage-1 cases forming 49·7% include them in a greater proportion.

Further, and consistent with that hypothesis, Bloom (1950) found extension beyond the breast in no less than 61% of all cases treated allegedly within six weeks, and MacDonald (1951) and Park and Lees (1951) in 59% of all cases treated within the first month. Obviously, if all the cancers in these series were progressive metastasising cancers, the proportion to be observed in the stage-1 state at longer durations or over all durations would be less than that so observed early in the disease. Stage 1 was reported in 35%, 35%, and 33% over all durations in these series. However, the fact that in other series covering all durations extension beyond the breast was found, as already noted, in all but 15–20% suggests that some of the stage-1 cancers in the three series cited could have been non-metastasising tumours. Supporting this suggestion is the fact that, even at the longest recorded durations in these series (5 years +, in that of Park and Lees), some cases still persisted as stage 1. Thus, in any series consisting exclusively of metastasising cancer, examined with similar proficiency, the proportion to be observed in the stage-1 state, even within the first month, would likely be less than about 40%, as in the series cited, and, over all durations, would be still less. Thus, without implying any precise limits, stage 1 forming a high proportion of any series covering all durations and examined with similar high proficiency must, because of incompatibility with the proportion likely to be so found in metastasising cancer, be highly suspect of including non-metastasising tumours.

Thus, while the stage-1 cancers of any series may possibly be or include non-metastasising types, the level trends in mortality in spite of an increase in the proportion of cancer treated as stage 1, the lack of any other credible explanation for the wide difference in proportions classified as stage 1 in different clinics, and the excess of stage 1 in some series over what could be reasonably expected in metastasising cancers point consistently to the stage-1 cancers in some series including, almost unquestionably, non-metastasising non-lethal lesions. Thus, because of their dubious character, survivals of stage-1 "cancers" cannot be considered conclusive evidence of the value of treatment in an early stage of development of lethal cancer.

DECREASING SURVIVALS WITH INCREASING DURATIONS FOUND ALSO IN UNTREATED CASES

The third form of evidence that early treatment reduces mortality is that, with increasing pre-treatment durations, for a period, the five-year survival-rates decrease. Provided that the numbers are sufficient to give significance to the differences, a consistent decrease in survival-rates with increasing pre-treatment durations, for a period, might appear to be sound evidence of the superiority of early treatment. However, when Daland's (1927) series of 100 untreated fatal cases are arranged in order of consecutive durations, and the subsequent five-year survival-rates for each successive group are calculated, those rates, for a period, show a progressive decrease determined by "natural selection," as MacDonald (1951) aptly puts it. Greenwood's (1926) more extensive data of untreated cases suggest a similar pattern, but unfortunately the records were not sufficiently complete to show the whole picture; and, in any case, differences in types, even in fatal cases, can vary the pattern of mortality and survivals for a short period such as five years. However, as a decrease in subsequent five-year survival-rates with increasing durations, for a period, has been demonstrated in untreated cases and is readily understandable and compatible with the nature of the disease, a decrease in survival-rates with increasing delay in treatment cannot be confidently attributed to the delay. Thus this form of evidence is not conclusive evidence of advantage of early treatment.

SUMMARY

These three forms of evidence, covering, it is thought, all that has been advanced as showing superiority of early or otherwise different treatment in preventing death, have thus been found lacking in conclusiveness. Park and Lees (1951) also have studied the evidence and concluded:

"(*a*) It has not been proved that the survival-rate of cancer of the breast, using the 5-year survival-rate as an index, is affected by treatment at all.

(*b*) The evidence strongly suggests that treatment is quite ineffectual in reducing the incidence of death from metastatic spread.

(*c*) If treatment is in any way effective, the effectiveness cannot be greater than that required to increase the overall 5 year survival-rate by more than 5 to 10 per cent."

As noted later, Truscott (1947), Bloom (1950), and MacDonald (1951) have drawn similar far-reaching conclusions from other fields.

Importance of Type in Determining Outcome of Breast Cancer

On the other hand, all the differences in survivals purported to show superiority of early or different treatment, as found in the reports examined, can be reasonably and consistently attributed to difference in selection of cases; in many instances obvious difference in the method of selection or in the recorded distribution of different types of cases allows of no other valid interpretation. Moreover, in analyses where difference in selection of cases has been duly weighed against difference in time or type of treatment, it is clear that it is the type of case that determines the outcome.

Lewis and Rienhoff (1932), in the Halsted Clinic, concluded: "Thus the type of tumour from a histological as well as a biological standpoint plays in our present state of knowledge an indeterminable rôle," and, "undoubtedly if operated upon properly the condition may be cured locally, and that is the only point for which the surgeon must hold himself responsible."

Grace (1937), comparing his results in simple and radical mastectomy (with irradiation in both), concludes: "The cellular structure of the tumor is the dominant factor, and surgical technique, irrespective of the extent of its radicalism, plays a definitely secondary rôle."

Truscott (1947), after seeking diligently for sound evidence of the value of early or different treatment at the Middlesex Hospital, says: "This investigation has forced one to the conclusion that no matter how early the case or thorough the treatment, no patient is free from the possibility of recurrence until death occurs from some other cause."

Bloom (1950) in a critical clinicopathological study in the same hospital says: "We are compelled to adopt the view that outcome in mammary cancer is determined largely by the histological type of growth, rather than by prompt treatment as soon as the lesion is discerned."

MacDonald (1951), from the division of surgery, University of Southern California, in a similar critical analysis of results of treatment, demonstrates clearly the "overwhelming influence" of "natural selection" and concludes: "... to no small extent the doctrine of synonymy of 'early' treatment and curability should be recognised for the shibboleth which it is."

Smithers et al. (1952), in their comprehensive study, also conclude that "the most important factor in prognosis in patients with breast cancer is the character of the tumours they develop."

Finally, in this regard, the reversal, as commonly seen, to higher survival-rates with pre-treatment durations of more than one, two, or three years is regularly attributed to difference in types. There is no alternative explanation. The "overwhelming" importance of type

is thus almost self-evident and is also well recognised—but, unfortunately, as Bloom (1950), MacDonald (1951), and Smithers et al. (1952) have more specifically pointed out, often neglected.

The hypothesis forced by the consistent evidence in vital statistics, that, owing to very early spread through the blood-stream in the vast majority of lethal breast cancers, neither early nor extensive treatment of the local lesion and its lymphatic drainage can materially reduce mortality, stands thus unopposed by any conclusive evidence but is well supported by evidence from critical clinical, pathological, and statistical studies.

Development of Metastases after Implantation Independent of Primary Tumour

As the primary lesion has no known specific influence on the *development* of remote metastases after their implantation, and as the vast part of mortality in breast cancer is due to the development of such metastases implanted before treatment, there is no logical basis for assuming that successful treatment of the primary lesion with its lymphatics can specifically influence that development or, therefore, materially postpone death.

Conclusion on Breast Cancer

It must be concluded, therefore, that, because of very early remote spread via the blood-stream in most, if not all, lethal breast cancer, neither early nor extensive treatment can materially prevent or postpone death from breast-cancer. This conclusion is drawn from such consistent evidence and is itself so free from untenable or conflicting assumptions and so unopposed by any conclusive evidence that it appears fully warranted and capable of bearing its weight. Moreover, it explains and reconciles, as no alternative does, the similarity in survival-rates reported for radically different treatments, and, along with the limitations of histopathology, it explains and reconciles other inconsistencies and contradictions, such as Smithers et al. (1952) find "rampant" in many and even the same reports throughout breast-cancer literature. By failing to explain or reconcile those conflicting claims and discords, alternative contentions reveal their own inadequacy.

Other Major Cancers

The recorded mortality of any other major cancer is so lacking in reliability and uniformity that it does not provide a suitable basis for measuring changes, but the recorded mortality of all cancer (combined) can be so used with caution. When so used it gives no encouragement that effectual control of mortality from any major cancer has yet been achieved. Examination of evidence supposed to be to the contrary reveals that, as in breast cancer, it is ambiguous, inconsistent, or fallacious; none of it is conclusive; most of it is a misinterpretation of survivals in stage-1 "cancer" as indicating results of early treatment or treatment in an early stage of development of lethal cancer. However, in those cancers in which, unlike breast cancer, local extension often causes death before the development of remote metastases, it is practically self-evident and well supported by clinical experience that life can be prolonged by treatment. Non-metastasising cancer, distinguishable with certainty from metastasising cancer only when metastases of the latter become manifest, can of course be cured; but it contributes only a small part of cancer mortality.

Summary

In spite of an expanding programme for control, and many other factors conducive to earlier treatment, the age-specific breast-cancer mortality-rates in Ontario show no declines but hold persistent levels. In spite of very aggressive programmes in some areas and none in others, the trends of age-specific breast-cancer mortality in each of the Canadian provinces, in Massachusetts, and in England and Wales appear practically identical and level. None gives assurance of a real decline. The failure of early treatment is thus established.

As the failure of early treatment is due to later development of remote metastases from earlier remote spread of cancer cells, it must be postulated that, in most (if not all) lethal breast cancer, remote spread takes place through the blood-stream before treatment can be instituted, and that consequently neither early nor extensive treatment of the primary lesion can effect any material reduction in mortality.

The limitations of histopathology are such that distinction cannot be made through it between remotely metastasising, locally metastasising, and non-metastasising types, or between lethal and non-lethal types; consequently comparability of two or more series cannot be assured, and a difference in survivals cannot be confidently attributed to difference in either time or type of treatment. Stage-1 cancer includes cancers of all durations, and includes, too, tumours which are suspect of lacking potentiality for axillary or remote lethal involvement. Therefore survivals of stage-1 cancer are not reliable evidence of survivals of lethal cancer treated chronologically early or in an early stage of development. As decreasing five-year survivals are found in untreated cancers of consecutive durations, a decrease in survivals in treated cases with increasing pre-treatment durations cannot be confidently attributed to delay in treatment. Thus none of the evidence purporting to show superiority of early or different treatment of breast cancer is conclusive. On the other hand, critical clinical and pathological studies have shown that the type of cancer determines the outcome. Thus the hypothesis based on the findings in vital statistics is unopposed by any conclusive evidence but is supported by critical studies from other fields.

As the development of metastases, after their implantation, appears to be independent of the primary lesion, there is no logical basis for assuming material postponement of mortality through treatment of the primary lesion with its lymphatics.

The very early remote spread explains, as no alternative does, the similarity in survivals obtained by different treatments, and, along with the limitations of histopathology, explains the inconsistencies and contradictions found throughout breast-cancer literature.

The evidence today does not provide any encouragement that effectual control of mortality from any major cancer has yet been achieved.

This does not mean that cancer or tumour of any type should not be treated. It does mean that investigation and treatment should be tempered with an understanding of the limitations of both diagnosis and treatment, and that claims, even more than objectives, should be kept within the possibilities of performance.

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QUALIFICATIONS OF MEDICAL AUXILIARIES

REGULATIONS [1] published by the Minister of Health set out the qualifications required for employment as medical auxiliaries in the National Health Service, from April 1, 1954, onwards. They are based on the recommendations made by the Cope Committees in 1951,[2] though they depart from them in some particulars.

The medical auxiliaries coming within the terms of the regulations are chiropodists, dietitians, medical laboratory technicians, occupational therapists, physiotherapists, radiographers, remedial gymnasts, and speech therapists.

In order to qualify after April 1 next, a person must obtain a certificate issued by one of the bodies named as "appropriate bodies" in the regulations. These bodies are:

Class of medical auxiliary	*Appropriate bodies*
Chiropodist	The Joint Council of Chiropodists The Society of Chiropodists
Dietitian	The British Dietetic Association
Medical laboratory technician	The Institute of Medical Laboratory Technology
Occupational therapist	The Association of Occupational Therapists The Board of Management for the Astley-Ainslie, Edenhall, and Associated Hospitals
Physiotherapist	The Chartered Society of Physiotherapy The Faculty of Physiotherapists The Physiotherapists' Association
Radiographer	The Society of Radiographers
Remedial gymnast	The Society of Remedial Gymnasts
Speech therapist	The College of Speech Therapists

These certificates will be accepted by employing authorities in the National Health Service when the Minister has approved the course of training and the examinations for the certificates. Those who, on March 31, 1954, come within the definition of being qualified at that date will be: those who are employed by hospitals or local health authorities; those who hold qualifications recommended as appropriate by the Cope Committees; and certain holders of qualifications given by the Joint Council of Chiropodists and the Physiotherapists' Association. In addition, the Minister will keep a list of persons whom he is prepared to regard as qualified. Similar regulations are being made for Scotland.

The Cope Committees advised that a statutory register of medical auxiliaries should be established, but provisions for such a register have not been included in the new regulations because, the Ministry say in a statement on the regulations, "there is not yet sufficient agreement on fundamental matters." Nevertheless, the Minister is setting up a working party, which representatives of the professional bodies are being invited to join, and which will aim at devising a generally acceptable plan. The Ministry's statement ends with the reassurance that the regulations will in no way prejudice the possible introduction of statutory registration.

1. The National Health Service (Medical Auxiliaries) Regulations, 1954. S.I. 1954 no. 55. H.M. Stationery Office. 3*d*.
2. See *Lancet*, 1951, i, 904.

Reconstruction

CENTRAL SURGERY FOR A PARTNERSHIP

WITH building licences no longer a major obstacle, general practitioners may now be able to let their thoughts turn to adapting or renewing their places of work. In the middle of a small Berkshire market town a group of five partners (now being increased to six) have had a new joint surgery built. The idea was born of dissatisfaction with the two cramped and inadequate surgeries where the group formerly practised—two at one house and three at another—and the type of building that they have had put up has been conditioned by local circumstances.

This little town has a population of some 10,000; but with the surrounding countryside the population depending on the ten local doctors is probably about 25,000. These ten doctors are more fortunate than most of their colleagues elsewhere in that they have at their disposal a fair-sized general hospital, including X-ray and physiotherapy departments, and a 25-bed maternity hospital. The practitioners hold clinical assistantships at these hospitals. Those held by the partnership are in the surgical, pædiatric, orthopædic, and obstetrical and gynæcological departments. Consultants visit the hospitals from Oxford, which is 6 miles distant.

THE BUILDING FROM OUTSIDE

The new building is approached through an impressive gravelled car-park, which could take perhaps 20 cars without overcrowding. This is not thoughtless extravagance, because (1) the surgery is set back from the main trunk road from the Midlands to Southampton and Portsmouth and no car can be left on the carriageway, which is especially narrow at this point, and (2) some of the many country patients come by car. In the car-park are a sizeable perambulator shelter and some bicycle rests (largely unused because patients prefer to prop their bicycles against the wall).

The building itself, roughly rectangular and in one storey, is of red brick with metal-frame windows surrounded by concrete slabs, which give an illusion of stone-work. This exterior has been designed with an eye to maintenance costs; and the only paint that will be needed as the years go by is for the narrow window-frames and for the drain-pipes, which are tinted a pleasing light blue.

INSIDE THE BUILDING

Towards the end of one length of the rectangle is the main entrance—a double glass door surrounded by a tiny, token, portico. Beyond this door a passage to the right leads to patients' lavatories (one for men, one for women), which are much used, and a cleaner's cupboard. Straight ahead is another double glass door leading into the waiting-hall. Here the office is on the right; and in front, on the opposite side of the hall, yet another double glass door leads to a minor-operation room and the doctors' lavatory. Spaced round the rest of the hall are three doors, each leading to two consulting-rooms and an examination room.

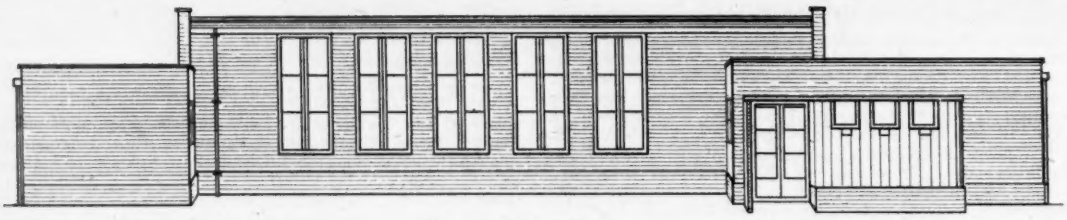
The Office

This has a large window, framed in light wood, opening on to the waiting-hall. Adjoining it is a room equipped as a dispensary with a hatch connecting it, too, with the hall. The group do not dispense, and the room is used as a side-room for urine tests, estimation of erythrocyte-sedimentation rates, and the like. It contains a microscope—which is not simply ornamental. Beyond this room, at the corner of the building, is a small store-room.

One side of the office itself is taken up by metal filing-cabinets, containing the medical record cards. The cards of the patients of all the doctors are filed together, alphabetically, in two groups according to sex. When a patient arrives he leaves his medical card at the office, and a secretary then takes his record card to his doctor; when he leaves he collects his medical card.

The partners have two secretaries, and a telephonist in the mornings; the building is open from 8.30 A.M. to 7 P.M. After a good deal of thought they arranged to have the telephone lines to their houses carried through the office switchboard. When the telephonist comes on duty at 8.30 A.M., she disconnects the telephone from the partners' homes. This means that throughout the day any personal calls to the doctors' homes must first be answered by the office telephonist or a secretary, who puts the calls through. But it also means that the doctors' homes are unruffled in the daytime by repeated buzzing. At night each partner sees to his own emergency calls.

At the weekends, when the office is unstaffed, one partner is on duty and a second is on call; and the name of the duty doctor is put up outside the building.



Front elevation.

This arrangement is possible only because the local exchange is manually operated: the exchange refers all emergency calls to the doctor on duty.

The Waiting-hall

This is spacious, measuring 47 ft. 6 in. by 16 ft., with a lofty oak-beamed ceiling at which the partners gaze with mingled pride and awe. Lowlier material than oak would have served; but the generous use of this wood at the heart of the building imparts to the whole a gracious air. The walls of the hall are of yellow brick. The floors here and elsewhere are of 'Accotile' on concrete—green in the hall but of different colours in other rooms. These tiles seem to be easy on the feet; they are not glossy (so that children who use the hall as a race-track do not often tumble); and they are kept clean and attractive by daily brushing and weekly mopping.

The waiting-hall is well windowed, and well furnished with some 100 green self-stacking chairs covered with waxed canvas, placed back to back down the middle of the hall and round its sides. Patients, without bidding, have got into the way of grouping themselves in order, according to their particular doctor.

The Doctors' Suites

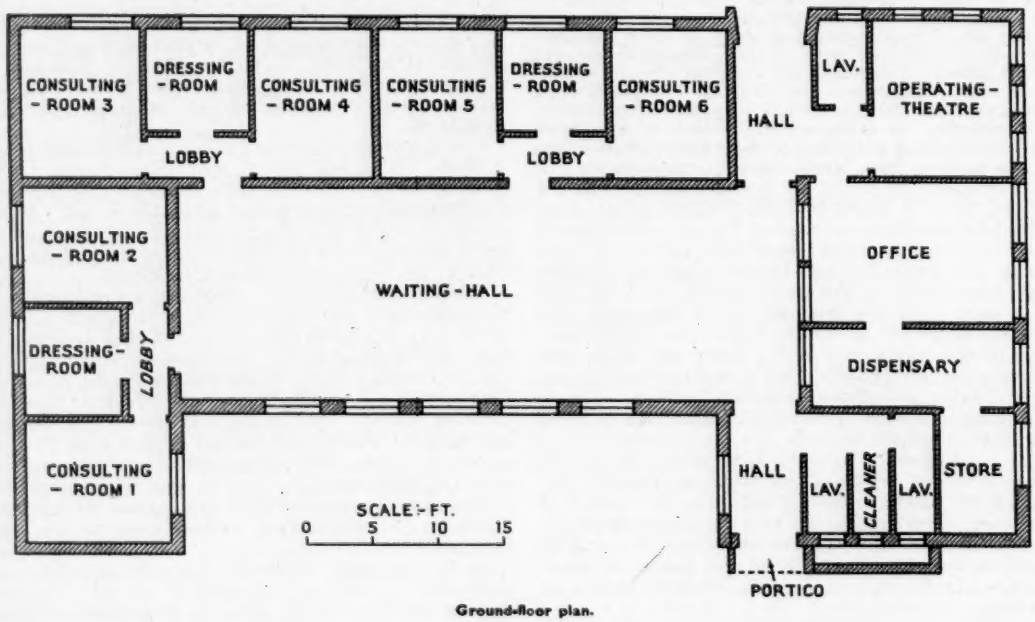
On each side of each of the three doors leading to the doctors' suites is the name of one of the partners. These doors, largely of glass, lead into a small lobby (8 ft. by 3 ft.). Ahead is an examination room (8 ft. by 7 ft. 7½ in.) containing a wash-basin, an 'Ascot' water-heater which also serves the two adjoining doctors' rooms, an examination couch, and a few accessories.

To right and left in the lobby are the two doctors' rooms. These are small (11 ft. by 9 ft.), but not, it seems, too small. They contain a wash-basin, a screened examination couch, an electric steriliser, and a desk, chair, and other furniture and equipment according to the individual doctor's taste. The cavity walls, painted a cheerful light cream, are insulated by plastic glass; and the ceilings are of fibre board with, beyond, fibre glass and three layers of bituminous roofing felt supported by hollow concrete beams. The doors are of plywood mounted on each side of a wooden frame; and these and the cavity walls give effective sound insulation.

OPINIONS

When this building was opened last July, the partners found that eight out of ten patients thought that it had been built by or for the Ministry of Health. Opinions varied from "This is a wonderful thing the Government's done" to "It's a disgrace that we should have to pay for it." On the whole patients have taken kindly to the building and to the joint waiting-hall, though a few rue the passing of the more intimate, if dishevelled, surgeries of yore, and one remarked: "I never knew there were so many sick people in the town. I'm never coming again."

After only six months' experience the partners are naturally cautious about drawing conclusions. Some questions are still wholly unanswered. One concerns heating the building. Against some expert advice they decided to rely on electric convection heating because this is clean and thus labour-saving, and because the



Ground-floor plan.

outlay for a self-stoking oil-heating device would have been heavy. The electric heaters, which are numerous, may warm the building each morning efficiently and quickly; but, as the architects have pointed out, such intermittent heating leads to condensation, against which the absorbent power of the rough plasterboard ceilings may not suffice. Furthermore, as the partners realise, a few years' electricity bills may surpass the initial cost of an oil heater.

With their own rooms they seem contented, but they advise others to give special thought to the placing of the wash-basin; wrongly placed, this may make the disposition of a couch difficult. They suggest that anyone designing a consulting-room should first experiment with models. (They also urge that the building should go up in the summer; in winter not only may bad weather interrupt construction but the short period of daylight and seasonal increase in illness may make it difficult for the doctor to see how the work is going on.)

With the general plan of the suites the partners are satisfied. Though they hold surgeries twice a day at the same times, they do not find it inconvenient to share an examination room (of course each also has an examination couch in his own room); and they are now examining patients more commonly and more easily than before. They also speak well of the plan by which the door of the doctor's room does not open directly on to the waiting-hall; for if the doctor does have to leave his room while a patient is there, the patient will not be seen by those outside. They believe, too, that the joint waiting-hall benefits the patient, who can see when his own doctor is called away and can transfer himself readily to the group waiting to consult one of the other doctors.

The partners have no doubt that this centre has eased their work. For instance, they can now more readily refer patients to one another, according to the special interests of each, during surgery hours. Since they all meet in the morning they can apportion calls to the remoter parts of their area, to avoid undue duplication of journeys; and they are confident that peak periods will be more easily managed. One reason is that they are spared much of the work that is not strictly medical, owing mainly to increased efficiency from centralisation. Before they moved into the new building the partners had two secretaries, as they have now; the only addition to the staff is the telephonist who works in the mornings. Yet they now have to give much less time to writing, ordering ambulances, making hospital appointments, receiving messages, and so on. Furthermore off-duty times are now more easily arranged. Perhaps the greatest gain, however, has been in closer personal relations. This is an old-established and contented partnership; but now that each partner sees all the others at work, they understand as never before each other's merits and each other's difficulties. They have taken to repairing, after the evening surgery, to the "dispensary," where they spend some time reviewing the day's events. This is an unpremeditated development—for they started on the enterprise without any preconceived ambition to bring closer together an already well integrated team—and it is the one aspect of the venture which their families can possibly view with disfavour.

FINANCE

The land was bought and the building erected and equipped for just under £10,000. Ownership of the building rests with a limited liability company, set up by the partners. This simplifies both borrowing money for the capital outlay and the contribution by any new partner of a proper share of the cost.

The architects were Messrs. West & Pritchard, of Abingdon.

Management of Burns

A series of six articles prepared by a subcommittee of the British Association of Plastic Surgeons *

V. TREATMENT OF THE NEGLECTED BURN

NEGLECT means failure to institute and maintain efficient systemic treatment, or failure to prevent infection from becoming a serious problem, or failure to graft the burn at the right time.

The commonest finding when such patients are admitted to plastic-surgery centres is their poor general condition. It cannot be emphasised too often or too strongly just how important are anæmia, hypoproteinæmia, and infection in prejudicing the treatment of any full-thickness burn involving more than 10% of the body-surface. Furthermore, these three conditions are interrelated and local treatment cannot be expected to succeed until they are controlled. Another serious handicap may be the complete loss of the patient's morale, for which the frequent painful and exhausting dressings are responsible. Regaining the confidence of such patients, particularly children, can be a difficult and time-consuming task.

ANÆMIA

In any full-thickness burn involving 10% or more of the body-surface secondary anæmia will occur, the exact cause being unknown. A temporary dysfunction in the activity of the bone-marrow, attributable in some way to infection and protein deficiency, is a possible explanation, certainly after the first week. Also, in view of the known life of a red cell, the speed with which the hæmoglobin level can fall after a transfusion certainly suggests the existence of some factor increasing the fragility of these cells.

If anæmia is allowed to continue, the consequences are: lowered resistance to infection; anorexia; hypoproteinæmia; and delay in the application of skin-grafts owing to persistently unhealthy granulation tissue. Such tissue is yellowish-grey and soggy, with an irregular surface, instead of the smooth bright-pink appearance it should have.

The treatment is to give blood early—from the very start of treatment in severe cases—and to repeat the transfusions as often as is necessary to maintain a high level of hæmoglobin (80% or more). This means that the hæmoglobin must be estimated every two or three days. When calculating the quantity of blood to be given, it is a help to remember that one pint (570 ml.) of blood should raise the hæmoglobin level by 7% in adults and 10% in children; one pint of packed cells, which takes about six hours to run in, will raise the hæmoglobin level by 12%. The liability to anæmia continues *until skin cover has been provided*, and the longer cover is delayed the more difficult it is to keep up the hæmoglobin to 80%, even with repeated transfusions.

Since transfusions may be required as often as twice a week in extensive burns, it is wise to avoid cutting down on to veins and to use the more distal veins as far as possible. The use of the scalp veins in babies or the external jugular (under anæsthesia) in children must not be forgotten.

METABOLISM

The outstanding feature is the disturbance of protein metabolism. In a severe burn, and especially in a neglected one, there is an increase in the basal requirement of protein because of the demand for tissue repair

* The members of the subcommittee are: Mr. R. J. V. BATTLE, Mr. PATRICK CLARKSON, Mr. RAINSFORD MOWLEM, Mr. ROWLAND OSBORNE, and Mr. A. B. WALLACE. They are glad to acknowledge assistance from Mr. A. D. R. BATCHELOR and Mr. R. L. G. DAWSON.

and the production of red blood-cells. The initial protein loss due to exudation and anæmia is followed by that due to toxæmia, discharge of pus, anorexia, negative nitrogen balance, and possibly hæmorrhage—either a secondary hæmorrhage or one caused by graft-cutting or removal of sloughs.

The appetite may be poor from an early stage, especially in children who, though they may grudgingly take carbohydrate and some fat, refuse protein. The patient will draw upon his reserves for his calorific requirements, initially the fat and later the proteins (muscles, liver, and spleen), so that the normal plasma-protein level (6·5 mg. per 100 ml., with albumin globulin = 1·7/1) may take some time to fall. There will, however, be the clinical signs of wasting and of exudation from the burned surface—an exudation which will continue until skin-grafts have taken and coalesced. Frequent estimations of the plasma-protein level are essential, for it is very hard to overcome a big fall, especially if the albumin/globulin ratio is reversed. Œdema of the legs in the late stages of a burn indicates such a severe fall. Healing will be delayed and pressure sores are more likely to develop so long as hypoproteinæmia exists.

As protein is essential for repair and energy, its loss must be anticipated. Plasma is a poor—and blood a good—source of protein, but they are insufficient. It is easy to order a high-protein diet and to specify good sources of protein, but quite a different matter to persuade the patient to eat such a diet. The sustained efforts of a good ward-sister are required: at first she may have to be content and let the patient choose palatable dishes, even if they are of little calorific value; but she should supplement them by adding a preparation of indispensable amino-acids—e.g., 'Casilan'—to some of the foods and most of the fluids, especially milk. In the worst cases a Ryle's tube can be passed and left in position. Mixtures containing the amino-acids can be run in to the stomach, but this should be done intermittently in order to diminish the nausea which is apt to follow. Feeding by amino-acids alone leads to very troublesome diarrhœa. Some patients can be allowed to eat what little food they desire during the day, the supplementary feeds being given overnight through a Ryle's tube.

Though a protein diet containing the indispensable amino-acids is essential to healing, and indeed to life, the diet must not consist solely of protein. A lack of carbohydrate may lead to ketosis, with the appearance of ketone bodies in an acid urine. The diet should contain the average daily requirement of 3000 calories, despite the fact that the patient is lying in bed doing little, if any, active exercise; but there should be more emphasis on the total protein at the expense of fat and carbohydrate. To this diet should be added sodium chloride and the vitamins.

An accurate chart of intake (fluids and solids) and output must therefore be kept, so that the surgeon and ward-sister are alert to the day-to-day requirements. Furthermore, the urine must be tested daily and the results recorded; and in the serious cases the nitrogenous and other constituents of the urine should be estimated by the pathologist.

INFECTION

No matter how efficient has been the original local treatment, bacterial contamination is to be expected when the dead tissue is separating and until skin-grafts have coalesced. Provided hæmolytic streptococci are not present, and the number of other bacteria (staphylococci, diphtheroids, and gram-negative bacilli) is small, there will be no serious consequences. In the neglected burn, it is commonly found that the infection has not been kept under control; and the result is that sloughs are slow in separating, and pale, exuberant, dirty-looking, yellowish granulation tissue appears. The other features are fever, with an irregular temperature, anorexia, and anæmia. The anæmia lowers the resistance to infection, and thus a vicious circle is established which becomes increasingly difficult to break as the general condition deteriorates. The amount of discharge increases and it has an unpleasant smell.

TREATMENT OF INFECTION

Little improvement will take place in the local condition unless the general treatment that has been discussed is assiduously pursued. It is the neglect of the general treatment which is responsible for the poor local condition far more commonly than the reverse.

The early removal of any remaining dead tissue should accompany these efforts to improve the general condition. Deliberate surgical removal with forceps and scissors, or with a skin-grafting knife, is the quickest method and should be performed with the full ritual of a surgical operation during a dressing carried out, not in the general ward, but in a treatment-room nearby. In children and babies, an anæsthetic may be required, and advantage can be taken of this to give a blood-transfusion. The débridement must be carried out with care so that as little blood as possible is lost; careless, hurried excision, though it achieves its object, can leave a severely bleeding wound and so cause further deterioration of the general condition.

The dressings applied over tulle gras should be designed to hasten the separation of any residual debris. Better results may be achieved by using compresses of a saturated solution of sodium sulphate or electrolytic sodium hypochlorite (5%), surrounded by gamgee and crêpe bandage—a many-tail for the trunk. Much time will be saved in the treatment-room if sterilised dressings, cut to shape, are available. When these dressings are renewed, once or twice a day depending upon the amount of discharge, it is unnecessary to remove everything every time—once in forty-eight hours will do. It is often enough to remove the outer dressings and remoisten the compress by means of an undine or dressing syringe.

There are two other methods of hastening the separation of sloughs. The first is the use of a warm (100°F) bath in which the patient lies for fifteen to twenty minutes followed by gentle and careful drying using huckaback towels. This method is unsuitable if the pulse-rate is more than 100 or the temperature exceeds 100°F. It is not necessary to install expensive brine baths.

The second method, which is a help when the patient is not fit to move, is the use of a Bunyan-Stannard bed. The burned surfaces are irrigated daily, with one of the solutions mentioned above, in large quantities at 100°F, and then carefully dried with warm air and towels. It is important to avoid sogginess and careful drying is therefore essential; a Bunyan nightdress is then applied as the sole "dressing." The day before the application of skin-grafts a firm dry dressing over tulle gras is applied to the granulations.

The use of enzyme débriding agents may cause pain and the results so far are inconclusive.

USE OF ANTIBIOTICS

In the neglected burn, the day-to-day local use of penicillin, streptomycin, chloromycetin, or other antibiotic achieves very little, for many of the bacterial strains, if not already resistant, rapidly become so. On the other hand, the substitution of streptomycin, chloromycetin, or polymyxin for the chemicals previously used in the compresses is of distinct value during the forty-eight to seventy-two hours immediately prior to the application of skin-grafts. Systemic treatment with aureomycin or terramycin is of great value in dealing with contamination by β-hæmolytic streptococci.

APPLICATION OF SKIN-GRAFTS

The application of autogenous postage-stamp grafts as early as possible should be the aim of the surgeon. In dealing with extensive burned surfaces, though it is preferable to have the whole area free of sloughs, time can sometimes be saved by applying grafts to areas which are ready to receive them and at the same time carrying out further débridement of other areas. In circumferential burns of the trunk, it is advisable to graft one surface at a time, and preferably the front of the trunk first, so that after the next stage the patient can be nursed prone upon intact skin surfaces.

DELAYED HEALING

In these neglected burns, it sometimes happens that all the grafts do not take completely, and small areas will not epithelialise for a considerable time. In other cases, complete healing may occur, but is quickly followed by scattered blister formation and by the appearance of superficial ulcers which heal very slowly. These complications can be very annoying to everybody, for they delay the discharge of the patient from hospital. They are best treated by leaving the areas exposed whenever possible, using general ultraviolet therapy, and allowing the patient to be up and about, preferably in the open air.

PHYSIOTHERAPY

Patients who have been allowed to adopt comfortable positions, and perhaps assisted in this by the well-meaning but injudicious use of pillows, often need the aid of graduated active exercises before they can extend flexed knee-joints. The lower limb may never have been involved in the burn and yet flexion of the knee-joints and drop-foot are often allowed to follow a long period in bed. The physiotherapist can begin treatment of these and other similar deformities while the patient is still in bed with unhealed burns, but clearly the amount of time she can spend will be dictated by the patient's general condition.

Splinting can be continued far too long, and although it is customary to advise that hands be immobilised in the position of function, such fixation must not continue indefinitely. Hands can be kept immobilised in this position for four weeks and full movements regained if healing has taken place. Where there has been delay in obtaining healing, the joints may be exercised by supervised active movements in a bath each day, and then carefully dried.

General exercises, preferably against resistance, will be required to assist these long-stay patients in weight-bearing. The patient who has been lying on his back will be the better for being encouraged to sit up, and for exercises given before he is allowed to get out of bed.

OCCUPATIONAL THERAPY

Children rapidly regain finger and arm movements or make the best recovery possible within the limits of any contractures. Adults may take a much longer time and must be encouraged to carry out normal movements of their fingers—e.g., when eating and dressing. Occupational therapy is useful if both surgeon and therapist know exactly what movements of the limb require assistance. More severe disabilities may call for a change of occupation when treatment is completed. Such patients can often benefit from a stay in a rehabilitation centre, but the older the patient the more difficult is the problem.

CONTRACTURES

In neglected burns, it is still the aim of the surgeon to obtain healing as soon as possible, but having achieved this he may often be disappointed with the amount of contracture which follows. Save for eyelids, which call for immediate attention, the patient will benefit from a change of hospital atmosphere before definitive surgery is undertaken. The almoner can often assist in deciding whether transfer to a convalescent home will be more beneficial than a return home. Whichever is decided upon, an early review must be arranged, so that the necessary operation can be undertaken at the best possible time.

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ROWLAND P. OSBORNE
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Public Health

District Nurses

IN his annual report for 1952, Dr. Stuart Laidlaw, medical officer of health for Glasgow, discusses recent changes in the scope of the work of district nurses. The development of the National Health Service has meant that fewer acute cases are nursed at home and more old people with chronic illnesses require attention in their homes. And Dr. Laidlaw attributes this change to two things: the publicity given to the health service, which has made the public feel that they must go to hospital to get the best treatment; and the tendency of doctors to refer many more patients to hospital, partly in fear of possible litigation. For one thing, district nurses now attend only a small number of sick children at home, and "practically every child who develops an acute bronchitis or pneumonia, particularly in the working-class areas, is immediately referred by the doctor to hospital for treatment." Dr. Laidlaw is disturbed by these changes, and he concludes.

"In many of these cases the skilled nursing provided by the District Nurse would give the child not only first-class treatment at home but avoid the separation of the child from his parents. In addition, there are those cases requiring daily dressing which were formerly dealt with by District Nurses but which are now asked to report daily at out-patient departments. The whole question of the place of the Home Nurse in the Health Service urgently requires consideration so that more effective use can be made of these highly trained nurses and expenditure saved on the Hospital Services."

London in 1953

A preliminary report by Dr. J. A. Scott, medical officer of health for the county of London, gives some provisional figures for 1953. The birth-rate for London was 15·1 per 1000 population, so that the progressive decline since 1947 continues, though it seems to be slowing down. The death-rate increased slightly from 11·8 per 1000 population in 1952 to 11·9 in 1953; and the infantile-mortality rate was 24 per 1000 live births, as compared with 23 in 1952. The maternal-mortality rate decreased from 0·76 per 1000 total births in 1952 to 0·50 in 1953. The number of notifications of new cases of tuberculosis in the county again fell, from 5231 in 1952 to 5113 in 1953; and there was a further decrease in the tuberculosis death-rate from 0·31 per 1000 population in 1952 to 0·24 in 1953.

Prevention of Food-poisoning in School Canteens

The Ministry of Education, in a circular[1] to local education authorities, has outlined the steps that should be taken to avoid the risk of food-poisoning in school canteens. The circular asks authorities to review their measures for the prevention of food-poisoning and in particular their arrangements for close coöperation between medical, teaching, and kitchen staffs; the observance of the rules of personal hygiene by all canteen-workers; the maintenance of hygienic conditions in the kitchen; and precautions in the preparation and cooking of food. It also reminds authorities that they should notify the borough or district medical officer of

1. Ministry of Education, circular 272.

health immediately an outbreak of food-poisoning occurs, so that he can begin his investigations and take precautionary measures without delay.

Missing Radium Found

A search directed by members of the staff of the atomic research station at Harwell has found three tubes of radium that had been missing at the Royal South Hants Hospital since Dec. 27.[1] Exploration of the hospital sewers with Geiger counters identified a source of radioactivity in a sewer near the entrance to the casualty department. The sewer was opened and the missing tubes, together with a radium needle lost in 1943, were recovered.

England and Wales in 1953

The Registrar-General has reported[2] provisional statistics for England and Wales for the year 1953 and for the fourth quarter of that year. These figures, with the corresponding figures for 1952, are as follows:

Rate	Whole year 1953	Whole year 1952	Fourth quarter 1953	Fourth quarter 1952
Live-birth (per 1000 pop.)	15·5	15·3	14·2	14·3
Stillbirth (per 1000 total live and still births)	22·4	22·6	23·3	23·2
Death (per 1000 pop.)	11·4	11·3	10·7	12·4
Infant-mortality (per 1000 related live births)	26·8	27·6	26·1	29·0

The stillbirth and infant-mortality rates for the year are the lowest ever recorded in this country. Births exceeded those of the previous year for the first time since the peak was passed in 1947. The death-rate in the December quarter set a new low record.

Parliament

Clean Food Bill

IN the House of Lords, on Jan. 20, at the committee stage of the Food and Drugs Amendment Bill, Viscount BLEDISLOE moved to insert a new clause after clause 10 (Provisions relating to milk): to ensure that all milk sold for public consumption by a cowkeeper or trade distributor must contain at least 3% of butter-fat. So far as he could ascertain, no civilised country was so far behind as England and Wales in being satisfied that milk was whole milk. Our present policy was fair neither to the public nor to the many dairy-farmers who tried to produce milk of high quality.

Lord WEBB-JOHNSON supported the purpose of the amendment but thought that in its present form it would lead to an unfortunate decrease in the milk available for consumption. He suggested that the price as well as the milk should be graded. Anything below the 3% fat-content should be labelled sub-standard milk. For culinary and domestic purposes where milk was going to be cooked, many people might prefer to buy the cheaper milk, leaving available a larger amount of the high-grade product for children and infants who needed it.

Lord CARRINGTON, joint parliamentary secretary to the Ministry of Agriculture, thought that the law on this point was about right. There was a presumptive minimum of 3%, but it was not illegal to sell milk containing less butter-fat than that if the farmer could prove that it was milk as produced by his cow. Though milk with a low butter-fat content was of low quality, it was not injurious. It was necessary to protect the consumer against deliberate fraud, but it would be a new principle to make it a criminal offence to sell a natural product merely because the quality was poor. It would not be possible for producers to comply with this standard at all times. He thought the farmers of this country had done a magnificent job in producing enormous quantities of milk such as had never been produced in this country before. Never had milk been of such a high standard as over the past few years. The amendment was by leave withdrawn.

QUESTION TIME

Safeguards against Frauds

Mrs. EIRENE WHITE asked the Minister of Health if he was satisfied that safeguards against fraud in the National Health Service were adequate, in view of the statement made by the president of the General Medical Council on undisclosed fraudulent practices.—Mr. IAIN MACLEOD replied: The matter is under constant review, but I have no reason to think that there is any serious inadequacy.

Mrs. WHITE: Is the Minister aware that a statement made by a person in such a prominent position in the medical world naturally causes uneasiness, and has he taken any steps since that statement was made some little while ago?—Mr. MACLEOD: I have taken no steps since the statement made by the president, but it is fair to say that perhaps the right interpretation has not been put on what was said. As I understand it, this was a warning that the G.M.C., quite rightly, take a grave view of any laxity in these matters, and was not an allegation that fraudulent practices or conduct were at all widespread.

Full-time and Part-time Specialists in the N.H.S.

Replying to a question, Mr. MACLEOD stated that in 1952 1776 full-time consultants were employed in the N.H.S. and 108,703 hours were worked weekly by part-time consultants. For 1953 the figures were 1858 and 112,668 respectively. In 1952 974 full-time S.H.M.O.s (including dentists) were employed and 17,263 hours were worked weekly by part-time S.H.M.O.s. The figures for 1953 were 1204 and 16,423 respectively.

Mr. H. A. MARQUAND: Is the Minister aware that there seems to be some feeling in certain sections of the medical profession that he may have been encouraging or directing a change from full-time to part-time service? Would he care to deny that?—Mr. MACLEOD: It certainly is not a matter in which I have taken any initiative at all. The number employed full-time and for hours of part-time work have both gone up.

Pay-beds

Dr. BARNETT STROSS asked the Minister whether he was satisfied that pay-beds in hospitals were being fully used.—Mr. MACLEOD replied: Statistics for last year are not yet available; but I have impressed on hospital authorities the importance of ensuring that the total occupancy of these beds, whether by paying or by non-paying patients, is no lower than that of other beds. Dr. STROSS: Is it not fair to say that, in part at least, it is our view that the high cost is a factor, for patients have to pay for the whole of the services associated with the bed plus all fees incurred. For these reasons, is it not time that the whole matter was reviewed? Will the Minister consider abolishing pay-beds as such and turning them into normal beds and amenity beds, which would be much better? Mr. MACLEOD: I certainly will not abolish pay-beds which have, I believe, a valuable part, just as private practice has, in the development of our service. We altered, in part at least, the regulations by which calculations for a pay-bed are made some time ago and I am watching that point. I sent a letter on this matter last summer to all hospital authorities, but I want to wait a little longer to see the result of the new regulations.

Closure of Maternity Units

Mr. HENRY HYND asked the Minister whether the closing of Springfield Maternity Home, Blackburn, was carried out with his approval; and what consultations took place with the doctors in charge of the patients in question before their patients were ordered to leave the maternity home.—Mr. MACLEOD replied: No approval on my part was needed, but I was aware of the proposal and saw no reason to dissent. I am informed that when the home was closed on Jan. 8, 7 patients were sent home and 5 transferred elsewhere. Steps were taken to consult all the doctors concerned before action was taken. The doctors of the 7 discharged patients were consulted and accepted the proposal. The doctor of 1 of the transferred patients objected; the other 4 unfortunately could not be reached before transfer, but a message was left

1. *Times*, Jan. 21, 1954.
2. Registrar-General's Weekly Return for England and Wales for the week ended Jan. 16, 1954. H.M. Stationery Office. Pp. 20. 1s.

for them. I regret that more time was not available for consultation, but I understand that no ill effects have followed the transfer.

Mr. HYND: Is the Minister aware that his information about whether the doctors were consulted is quite inaccurate, as he will see from correspondence which he must have received from the Lancashire local medical committee, the British Medical Association, and other bodies? Will he look into the matter again because of the indignation expressed locally about the high-handed way in which the closing took place?—Mr. MACLEOD: The information was given to me by the medical authorities in all good faith and I have given it in good faith to the House. It may be wrong, but I will be happy to look into it again.

Replying to further questions, Mr. Macleod said that Springfield had not been lost to the National Health Service. It was a 20-bed general-practitioner maternity home and was to become a home for 30 chronic sick. He thought that everyone was satisfied that there would still be adequate maternity beds available in the district.

Mr. ERIC FLETCHER asked the Minister what protests he had received about the sudden closure of the maternity unit at the Mildmay Memorial Hospital.—Mr. MACLEOD replied: I have had one letter from local general practitioners and one informal letter from the British Medical Association. Mr. FLETCHER: Does the Minister realise the great inconvenience caused to 200 patients who had arranged to have their confinements in this hospital? Is it his policy to close down maternity beds without warning like this?—Mr. MACLEOD: I was a tenant at will in this building and no action of mine or of the regional hospital board led to the closing.

Causes of Blindness

Mrs. WHITE asked the Minister if he had considered the report of Professor Sorsby on the causes of blindness and what action he proposed to take—Mr. MACLEOD replied: I have asked hospital authorities urgently to review and, where necessary, improve their arrangements for the treatment of patients suffering from eye diseases, in particular cataract and glaucoma. I have also asked medical officers of health to include in their annual reports for 1953 information as to the steps that are being taken to follow up cases shown on registration as requiring remedial treatment, and I am considering whether the examination at registration can be used to obtain better information as to possibilities of the blindness being relieved.

Mr. SOMERVILLE HASTINGS: Will the Minister consider sending to general practitioners a request that all cases of incipient blindness not due to errors of refraction may be sent at once to an eye specialist?—Mr. MACLEOD: Yes, I shall be glad to consider that.

Hearing-aids

Dr. STROSS asked the Minister whether he could give an estimate of the percentage of bone-conduction hearing-aids required by the population as compared with air-conduction models; and how large the waiting-list was for the former type.—Mr. MACLEOD replied: The proportion is estimated at less than 5%. Separate waiting-lists for bone-conduction aids are not at present available, but about 7000 patients in England and Wales have been provided with them in the twelve months since they became available, and supplies are ample for the demand so far revealed. Within a month or two there will be no real waiting-list for these aids.

Replying to a further question Mr. MACLEOD said that by Nov. 28, 1953, 29,526 Mark III aids had been issued to users in England and Wales. This model had a higher power output and used smaller batteries than earlier models, but the cost was expected to be about the same.

Calomel in Teething-powders

In answer to a question Sir DAVID MAXWELL FYFE, the Home Secretary, stated that he had no power to prohibit the use of calomel in the manufacture of teething-powders, but he understood that the only firm known to have been manufacturing such powders wholesale in recent times had decided to omit this ingredient. Retail pharmacists who manufactured their own brands of teething-powders or soothing powders had been advised in the *Pharmaceutical Journal* to use safe aperients in lieu of calomel.

In England Now

A Running Commentary by Peripatetic Correspondents

THE waiting-room was full today. They were mainly aged with a high incidence of hemiparesis, angina, and œdema. They had arrived, all by special invitation, just before the police had erected the barriers across the road, and they had lounged in the shade, or dared the hot sun on the lawn, or made short excited trips to the fence to gaze on the filling volume of the road. They were, without their knowledge, being subjected to an experiment in lay therapy.

Over the fence was the white blaze of the road twisting between the long cordons of the Army, Navy, and Air Force. Beyond was Cranmer Square with the gold pinnacles of the trees deepening to the liquid purples flowing to the pools of shadow on the grass. From the Southern Alps came the gentlest of breezes with light interrogative puffs of curiosity and a hushing response from the flags, the streamers, the bunting, the floral emblems, and all the varied ingenuity of decoration.

Spaced down the street were the loudspeakers, relaying the radio. At intervals were the bands, the marching girls, the St. John Ambulance, the veterans with their rows of medals, the traffic inspectors, and the police. Behind the stolid figures of the Services were the people, ranging in age almost through a century. They had their flags and their flowers, their chairs, ladders, boxes, and periscopes. They had that quality of good humour that is possible in a crowd only when all conflicts have suddenly flowed into one grand stream of unanimity. They were on holiday and they had no cares.

A murmur far down the road, out of sight beyond the bridge, was suddenly accentuated against the hush further up. It mounted in volume to the deep full roll of cheering. From the waiting-room, in a flutter of halt and hurry, came the last occupants to mount their staging behind the fence. The cheering neared, no longer single-toned but syncopated as section after section of the crowd waved and shouted. Slowly a black car passed and then came the second car flying the Royal Standard. And now the cheering swelled and was purely reflex and completely unheard, for all eyes were for the Queen and the Duke.

Of course we in New Zealand have all been wrong in our assessment. Hitherto we have had only the verbal description, the static picture, and our imaginations. We have been diagnosing on the case-notes without the patient. She is much more beautiful than we thought. She is much more regal. She is much more attuned in sympathy to her people than we thought possible. She has a measured dignity that is more symbolic of her status than is a crown or a throne. Merely by her presence she has changed loyalty to enthusiasm and replaced respect with affection.

When later, by circuitous streets which an imported police had overlooked, the patients were returned home the talk was of the Queen only. No symptom was mentioned. There were no prescriptions and none of the clutterings of orthodox medicine. They had all been suddenly restored to health—health of the spirit anyway, and health of the body thereafter is a matter of indifference.

* * *

With 1953 over and 1954 almost 30 days gone, I decided to do a little maternity stock-taking and find out what my practice had been up to.

On the credit side my two-thousand-odd units last year produced some 50 healthy infants, including a couple of 6 lb. twins. Two units with severe toxæmia had to go to hospital. Another half-dozen units had P.P.H.'s, two of which needed transfusion, and it is interesting that they were the only two who, owing to (*a*) B.B.A., and (*b*) a flat tyre, did not have ergometrine in the third stage.

On the debit side, to my knowledge, six aborted and two had stillborn infants. One had toxæmia; in the other the cause was unknown. She was perfectly well but heart sounds disappeared suddenly in the 36th week and she delivered herself of a macerated fœtus a couple of weeks later. One primip. was delivered of an anencephalic monster. A second produced a hare-lipped cleft-palated, blind, 7 lb. bundle of

humanity which despite a congenitally abnormal heart recovered from operation on its lip and continues to thrive. A third, with the aid of forceps, produced an infant with a tremendously hypertrophied left kidney and bladder whose rapidly rising blood-urea is even now threatening to race the surgeon in his bid for life.

Truly a mixed bag, but in the West at any rate N.H.S. doctors aren't merely clerks. We do see a spot of real medicine sometimes.

* * *

The "narrow-stream" idea of the spread of polio virus did not appeal to the consultant and he turned from *The Lancet* to his book of trout flies. He had been brought up in what might have been called the "rising-tide" school, which held that polio epidemics appeared on the crest of a widespread and mounting wave of carriers. Certainly, the sea-trout rose to his Alexandra lure on the top of a flood tide in a Shetland voe. There would not be many fish in a narrow stream, he thought. As he looked at his flies they suggested another analogy to him, perhaps a better one, combining the truth of the other two. Might not the spread of the virus be like that of a noble river which had its narrow rapids but also its large pools with eddying backwaters, which sometimes went underground and sometimes rose in spate over its banks to flood the meadows?

* * *

Winter sports in England are all very well in their way, but I often wonder if we are psychologically and materially equipped for mastering the art of the ski. Most Continental and Canadian toddlers take naturally to such acrobatics soon after they assume the upright posture, so that they graduate from the clumsy mistakes of incoördination long before bones become brittle enough for even a greenstick fracture. They accept the rough and tumble with an elastic resilience denied to older and stronger muscles foolishly tensed to brace against the crash. The price we pay for learning late is spiral fractures of the tibia and fibula and the snapped malleoli.

Yet the smallest paragraph in the press that snow has fallen on the mountains, a wireless weather warning that the tops are dangerous, and the stampede for self-destruction starts. Car after car comes whizzing into our village with skis strapped to the roof, tied on the running-board, or sticking out through the hood. Skis are unloaded and stacked impressively around the hostelry door, and the bar is soon filled with a merry throng of duffle coats and peculiar pantaloons.

Mind you, not every pair of skis betokens homage to the high snowfields. Skis have a definite snob-value and may just be part of the collection of crampons, rope, karabiners, and pitons which form the scarcely movable stock-in-trade of those who walk for pleasure. Anyone can pick up enough jargon from the guide-books to talk knowingly about skins and Kandahar bindings and enjoy a convivial weekend with his malleoli intact.

Whether it is snobbery or merely a "dead-but-I-won't-lie-down" spirit which inspires the middle-aged to start skiing is immaterial in view of the outcome. Over-weight, over-brittle, over-soft, and over-confident, they come hurtling down to attempt Christies on nothing much more than a breath of hoar frost or half a dozen snowflakes forgotten by the sun.

I often think it is pity that mountain accidents are so coloured by Drama with a capital D, and that lay opinion expects everyone to be "rushed" to hospital. Whether the patient is fit to be moved tends to be overlooked. If I were a casualty with a broken leg on a mountain top I think I would like to be properly warmed up and given time for the morphine to act before being jollied down the rough track by a band of muscular enthusiasts. Some day we may enjoy the merciful services of the helicopter, but until then we should respect those deadly mountain killers, shock and exposure.

* * *

News from Hospital

Dear Dr. Smith,

I have to refer to my letter of 29th September and note that the patient I wrote of is Mrs. Green and not Mrs. Kelly. I assumed she was my patient's mother when in fact she is her aunt.

Yours sincerely,

A.B.C.

Letters to the Editor

LENTE INSULIN

SIR,—The findings of Dr. FitzGerald, Dr. Thorn, and Dr. Malins (Jan. 23) in their investigation of the therapeutic action of equal doses of 'Insulin Lente' (insulin zinc suspension) and the older insulins, differ considerably from those reported by Murray and Wilson[1] and Lawrence and myself.[2] Their conclusions, however, agree more closely with our own, now based on an experience of well over 200 cases.

As Dr. FitzGerald and his colleagues suggest, this discrepancy is probably due to the fact that the previously recorded cases were in good biochemical control at the time when the change was made and, in our cases, none was taking more than a moderate dose of soluble insulin. It is difficult to understand why poorly controlled patients should have been chosen for comparative studies. In this connection, Lawrence and I prefaced our original results with a list of conditions necessary, in our view, for the therapeutic trial of any insulin, the last of which was that the patient must be in good control on existing methods before comparison can be made with a new insulin in similar dosage. Clearly, these poorly controlled diabetics required a larger dose of the older insulins to bring their "mean blood-sugar level" down to normal, and a similarly increased dose of I.Z.S. lente might have had the same, a better, or a worse effect. One of the interesting features about lente is the great improvement brought about by comparatively small changes in dose when a critical level has been reached.

While not questioning the assessment of control in the cases reported, I find it difficult to interpret mean blood-sugar results, especially those taken in the early afternoon after lunch (how long after?) in terms of diabetic control: and I think it unfortunate that the results of the 12-hour urine tests referred to in this article were not given; quantitative estimations of sugar excretion on the different insulins under standard conditions would have been worth recording. In these circumstances, it is to be hoped that the rather disappointing results obtained by Dr. FitzGerald and his colleagues will not be regarded as an indication that the new insulins are inferior to or no better than the existing preparations. The only possible conclusions that can so far be drawn from published results and our more recent experience is that:

(1) Lente insulin in a single dose controls most mild and moderately severe diabetics.

(2) Diabetics who require large doses of soluble insulin do not appear to be controlled by a single injection of lente and relapse badly if put on it; this applies particularly to those cases who require two injections of soluble insulin daily. A certain number of less severe cases also do not do well on lente, as at present constituted.

(3) The new insulin preparations are unsuitable for the treatment of coma, precoma, or severe ketosis.

(4) Changes from the old to the new insulins should be made under careful supervision.

Diabetic Department,
King's College Hospital,
London, S.E.5.

WILFRID OAKLEY.

CENTRIFUGALLY TRAVELLING NON-THROMBOTIC PHLEBITIS

SIR,—In your issue of Jan. 16, Dr. Parkes Weber describes a case under this title and suggests that it is the same condition as I have briefly mentioned in the *Synopsis of Medicine*. I have no doubt that this is correct.

In the upper limb the swelling commences in or under the biceps. A swelling about one inch long emerges from the muscle and in the course of weeks travels slowly

1. Murray, I., Wilson, R. B. *Brit. med. J.* 1953. ii, 1023.
2. Lawrence, R. D., Oakley, W. *Ibid*, 1953, i, 242.

down the limb dividing into two or more branches, which finally diminish and die out around the wrist and back of the hand. There is no obstruction to the circulation, and, after the swelling passes, the veins appear normal. I thought the lesion was a phlebitis, but Dr. Parkes Weber is probably more correct in describing it as periphlebitis.

In 1923, I had two identical cases, unrelated, under my care at the same time. I found a description of the condition under the title phlebitis migrans in a textbook, I think American, but I have not been able to trace it subsequently.

In 1929 I had a third case, similar to the others. I did not recognise any other lesions and recovery appeared to be complete, but I lost sight of the patients after a year or two.

In the course of years I have inquired of many physicians if they had seen similar cases. At a meeting of the Association of Physicians on thrombophlebitis migrans, I mentioned this condition and asked if anyone had seen it, and after the meeting the late Dr. Lewis Smith told me of a case which had been under his care. Otherwise I have never met anyone who knew of it.

My three cases were almost identical and unlike anything else which I have seen or read about.

London, W.8. HENRY TIDY.

SALARIES OF WHOLE-TIME SPECIALISTS

SIR,—Consultant A is employed by a regional hospital board for the maximum number of sessions as a part-time consultant and undertakes almost the optimum number of domiciliary visits. He also has a private consultant practice. Consultant B, who probably is responsible for more hospital patients than his colleague A, is employed as a whole-time consultant.

In addition to fees from private patients, income-tax concessions, and more generous travelling allowances, all fully described in Dr. Gilchrist's letter of Jan. 23, consultant A can earn over £400 per annum more for his part-time service to the National Health Service than consultant B. Are there then two grades of consultants? How otherwise can the comparative grades of remuneration be explained? This is the basic anomaly between whole-time and part-time salaries, and it was mainly created by the decision to recompense only part-time specialists for domiciliary consultations—a decision which did not follow the spirit of the Spens report.

The position of senior hospital medical officers is another matter. Only a generous increase, commensurate with their clinical responsibilities, can justify the retention of the grade.

Nottingham. WILLIAM MORTON.

SHOE DESIGN AND THE GREAT TOE

SIR,—I read with considerable interest the letter by Dr. Haines and Mr. McDougall in your issue of Jan. 16.

For the past 18 years my company and its associates have been manufacturing women's fashion footwear in multiple widths, but though we make over a million pairs of shoes a year our contribution towards the correct fitting of women's feet is but a drop in the ocean.

As no doubt you are aware, the majority of women select their shoes by style, colour, and price—in that order—and whilst they are very happy if they find a shoe that fits, they are, generally speaking, prepared to sacrifice fit for style and colour if a shoe of the style and colour they want does not fit.

Whilst a manufacturer and retailer can, of course, emphasise the importance of buying shoes that are correctly fitted, it seems that the public are more likely to take the advice of the doctors, if the doctors would only agree to publicise, on a national basis, the dangers of ill-fitting footwear.

From the point of view of providing a manufacturing and retail fitting service, the U.S.A. is far in advance of this country. The average American shoe-shop carries 90% of its stock in a minimum of five widths to each size and half-size; and this stock is carried over a wide range of fashion shoes in several colours.

Whilst it may be true to say that certain extreme fashions in footwear are quite impossible to fit, nevertheless there are a considerable number of attractive-looking shoes which could be correctly fitted if the public were only made aware of the necessity for demanding that their shoes should be properly fitted.

Selby Shoes Limited,
London, W.1. J. F. H. HINTON.

PRESCRIBING AND PROPAGANDA

SIR,—Being both on the receiving end for publicity material and the producing end for medical illustration, I would, in general terms, support Miss Treadgold's letter (Jan. 16). Dr. Herxheimer and his colleagues (Jan. 2) are crying for the moon if they hope to abolish the pharmaceutical circular; and indeed much of the material put out by the leading houses is very informative. Unfortunately, a far larger number of lesser organisations have not such high standards, and it is they who attract unwelcome notice.

I have been concerned in an advisory capacity with the production of a number of medical motion pictures under commercial sponsorship by full-time film units. I have found the manufacturers almost overanxious to avoid offence or "plugging," and delighted that their publicity material—which they honestly acknowledge as such—is being put to good purpose. And I would stress that with the present limited scale and finance of departments of medical illustration in medical schools these instructional films would not otherwise be made at all. This principle of controlled and enlightened sponsorship has, incidentally, been accepted by the British Medical Association, through its film committee, with conspicuous success. There has never been the slightest "ethical" trouble, for the committee has the last word.

Miss Treadgold speaks of the gap which exists between the manufacturers and medical illustrators, and suggests how it may usefully be filled. That this can be so is shown by the excellent material, by leading medical artists and photographers, which appears in some of the American house journals—overenthusiastically presented perhaps by British standards, but nevertheless useful teaching material if one takes the trouble to use it.

The manufacturers must have illustrative material of all types: surely we can set aside the outworn concept of commercial contamination and see that they get good work which will be of permanent value at all levels from first-aid classes upwards. If we do not coöperate, we cannot blame them for looking elsewhere, and we shall go on being unable to afford the more costly forms of instructional material.

Didsbury,
Manchester. ROBERT OLLERENSHAW.

SIR,—I am very interested in Miss Treadgold's letter, with the constructive suggestions about advertising material sent to the doctors.

In the School of Nursing in this hospital we use much printed material for the sister-tutors' and nurses' reference, and on our "topical-boards" illustrations to help with lectures and classes. We are always grateful when the pharmacist to the hospital can supply us with suitable material from different firms. The central-supply department and the catering department, as well as individual lecturers, also make contributions to our classrooms. Sometimes we have illustrations and statistical material from the U.S.A.

We should find it very helpful if the manufacturers could be encouraged to produce material that would be

more useful to doctors and nurses, in the same way that many firms are making films of educational value. Sister-tutors would, I am sure, be happy to suggest a number of subjects and types of material which we could use.

Guy's Hospital,
London, S.E.1. DOROTHY HOLLAND.

MEPHENESIN IN RHEUMATISM

SIR,—Dr. Larkin, in his letter of Jan. 16, gives brief particulars of 10 cases of low-back pain and the results after treatment with mephenesin. He attempts no explanation of the cause of the pain nor of the mode of action of mephenesin, but from the details he gives it seems likely that there was in each case some muscle spasm which had become self-perpetuating. The usual mechanism in such cases, as Dr. James Cyriax has pointed out repeatedly, is a strain of a spinal joint or joints with tension, possibly œdema, in the capsular and ligamentous structures, causing pain which produces a segmental reflex muscle spasm. The spasm itself then causes pain which maintains the spasm. Mephenesin will generally abolish spasm by breaking the vicious circle and relieving the condition, as long as there is no persisting derangement in the spinal joints.

The unsatisfactory aspect of this treatment is the frequency with which such conditions recur. The suggested explanation is that they do so because of mechanical faults in the spine which restrict its normal range of local movement and so put repeated abnormal strains on the active joints. I venture to suggest that spinal manipulation is a much more logical treatment of low-back pain than is mephenesin, that its results are usually much more permanent, and that the 2 patients in Dr. Larkin's series who did not respond to mephenesin are of the type which the manipulator sees daily and relieves easily.

London, S.W.3. JOHN EBBETTS.

FREEDOM TO PRESCRIBE

SIR,—The second interim report of the Joint Committee on Prescribing (the Cohen Committee) says:

"From the outset we agreed that wherever our discussions might lead us there should be no absolute restriction on the prescribing by a general practitioner of any drug which in his opinion was necessary for the treatment of his patients. This meant that if we were to recommend that certain drugs should not be prescribed by the practitioner, he would still be at liberty to prescribe them: . . . however, he might have to justify his action before his colleagues on the Local Medical Committee. This freedom of prescription was a fundamental assumption throughout our discussions."

And the report goes on to say:

"We therefore recommend that proprietary preparations in category 1 should be freely prescribable and that preparations in categories 2, 3, and 4, which we regard as not therapeutically superior to standard preparations, should be prescribable subject to . . ."

There follow certain conditions. The logical interpretation is that drugs in categories 5 and 6 are not freely prescribable, and that the committee's fundamental assumption of freedom has been disregarded.

Admittedly there is no good reason to believe that a doctor who had great faith in one of these remedies and who was determined to use it would be penalised by the local medical committee, but the threat to freedom remains; and the position for the consultant suggesting such a remedy is difficult, for the G.P. may retort that the consultant is not familiar with the Cohen categories. Again, probably very few doctors ever prescribe drugs in these categories, and maybe some of these preparations are worthless; but at least some are the result of painstaking research and would clearly not have been marketed unless the firms concerned had thought them of use and capable of standing on their own merits. It seems to me that the committee's recommendations may prematurely condemn a potentially effective drug, and that it would be much wiser to leave these drugs to find their own level. I would prefer complete freedom without categories to dubious freedom with them.

At another point the report observes:

"Since, however, the responsibility for prescribing should rest solely with the practitioner, the committee (with one dissentient) regards it as undesirable that medicinal preparations advertised direct to the public should be prescribable on form E.C.10."

The report thus suggests that a practitioner is solely responsible for his prescribing (which of course he is), but that he is not capable of resisting the requests of his patients for drugs which have been made attractive to them by public advertisement. Surely it will need a still greater sense of responsibility for the practitioner to prescribe drugs in categories 5 and 6 which he believes are for the good of his patient because the risk will be greater than that of causing the displeasure of the occasional patient wanting a drug at the service's expense instead of buying it over the counter.

We may reasonably ask what has been the cost of the work of the Cohen Committee and whether this sum is likely to be saved as a result of its recommendations.

Flimwell, near Wadhurst,
Sussex. G. E. LOXTON.

REACTIONS TO PENICILLIN

SIR,—The excellent article by Mr. Bell (Jan. 2) has led me to believe that the following case is worth reporting.

A girl of 16 had a right upper lobectomy for chronic tuberculous cavitation. She had definite, but not severe, bronchiectasis throughout the right lung, and there were some healed tuberculous lesions in the left lung. She had produced no sputum for a long period, but gastric lavage was often positive. She was given 500,000 units of crystalline penicillin G for eight days after the operation to protect the dry bronchiectasis, and this object seemed to be achieved.

A month after operation her temperature started to mount and she had a lot of rhonchi and coarse râles in the remaining part of the right lung. She was put on 500,000 units of crystalline penicillin G twice a day. The third injection was given while she was in the middle of her physiotherapy exercises. A quarter of an hour after the injection, and a minute or two after stopping her exercises, she suddenly became very breathless and went grey. The girl has very fair hair and highly coloured face, arms, and hands. The fair hair and high colour have been much intensified by sanatorium life. Her face was grey and covered with fine perspiration; and her eyes were reddened. Her red arms had an unusual dusky shade, and the wrists and hands were very blue. Her breathing was very difficult and her pulse fast and weak. She was very much afraid. Examination of the lungs and heart did not add to what was already known. The onset suggested that the attack might be connected with the injection, or with the physiotherapy (assisted coughing and postural drainage).

She was given oxygen and an injection of nikethamide and gr. 1/6 of 'Omnopon.' In a few minutes she showed signs of improvement; the foot of the bed was raised, and an hour later she had ceased to be a cause for worry. On recovering, she said that she had felt something in her windpipe and she had had tingling in her tongue.

She is not known to have had penicillin at any time before the operation. Three years ago, at another sanatorium, she had a rash and pyrexia after a month's course of streptomycin and *p*-aminosalicylic acid (P.A.S.). This rash was attributed to streptomycin and the drugs were stopped. At this sanatorium, a one-day course of P.A.S. (12 g.) produced an urticarial rash all over the body; and on another occasion a ten-day course of streptomycin, starting with 50 mg. and ending with 100 mg. daily, produced an extensive scaling and splitting of the skin, especially on the hands. She has been able, however, to take isoniazid (200 mg. daily) without any reaction. Repeated attempts to desensitise her to streptomycin and to P.A.S., using methods which have been reasonably successful with other children, have failed. At present another attempt at P.A.S. desensitisation, using a much smaller initial dose and increment, appears promising.

There is no family history of chest trouble or allergy. The girl herself has not had any allergic manifestations apart from the ones I have mentioned, but she is known to have had non-tuberculous bronchiectasis for at least six years.

Abergele Sanatorium. J. M. BATTERSBY.

SIR,—Mr. Bell's article prompts me to record these two reactions to procaine penicillin.

A man, aged 33, with a carbuncle of the forearm, was given 'Distaquaine Suspension' (2 ml., 600,000 units) into the deltoid. Next day he said that when he left the surgery, about 30 seconds after his injection, he noticed a foul taste and smell in the mouth and nose, a bursting sensation in his head, pins and needles, mainly in his face, and buzzing in his ears, all noises seeming very loud. This lasted about 20 minutes while he slowly walked home. He thought that this was a normal reaction.

A man of 38 had a carbuncle of the neck. His third injection of 'Duracillin A.S.' (2 ml., 600,000 units) was given into the left buttock as he lay prone. About 30 seconds later he had similar symptoms, including the foul taste and smell. He was pale and rather clammy, but his breathing and pulse were normal. He recovered after resting for about 15 minutes.

Injections were given to both men on the following day without incident. Neither had received penicillin before.

Obviously, both these injections were made intravenously, despite the usual precaution of withdrawing the plunger. Three reasons have occurred to me:

(1) The procaine-penicillin particles may have blocked the needle to suction but not to propulsion.

(2) Suction may have caused collapse of a small vein before blood could enter the syringe.

(3) The force of the injection may have ripped open a small vein in the muscle.

Intravenous leakage from an intramuscular injection is probably not uncommon. Should this occur in a person already allergic to penicillin, the result might well be fatal.

Norwich. M. H. RUSSELL.

URETHRAL APOPLEXY

SIR,—I cannot let your annotation of Jan. 2 pass without a warning.

Provided the clinician is confident in his diagnosis of *malignant* hypertension, he may be justified, in view of the grave prognosis, in concluding without further investigation that the hypertension is alone the cause of the hæmaturia. However, danger lies in that this may become the practice where, in fact, only benign hypertension exists; in which case some other abnormality amenable to surgery may be missed unless a complete urinary investigation, including cystoscopy, is undertaken.

Bath. C. PATRICK SAMES.

THE SIMPLE GANGLION

SIR,—Although the series of cases which I have been able to follow for a period of ten years is even smaller than the series on which Mr. McEvedy (Jan. 16) bases his apologia for injection treatment of the simple ganglion, I should like to make an appeal for treatment by simple rupture.

Of course, these ganglions recur—as they do after any other form of treatment—but the treatment can be repeated any number of times with little discomfort or inconvenience to the patient.

During the ten years since I became a convert to this form of treatment, I have not stayed long enough in any one place to follow up my cases, with the exception of the 3 members of my immediate family circle whom I have treated—but these may be allowed as the most exacting critics.

In the matter of technique increasing experience makes rupture by transfixion with a tenotomy knife seldom necessary. Attempts to rupture the ganglion by a sharp blow (as with the traditional method of the family Bible) rarely achieve anything, save to make the ganglion so tender that the patient is prepared for its excision. With practice, however, the vast majority can be ruptured virtually painlessly by pressure with the ball of the thumb. The ganglion is first thrown into prominence and fixed by appropriate movement of the neighbouring joint—the common type requiring extreme flexion of the wrist.

Guernsey. BRIAN WEBBER.

THE RECENT BURN

SIR,—Dr. Gardner (Jan. 16) asks for good reasons for puncturing blisters. A blister more than an inch or two in diameter will inevitably burst, soaking into the dressing and providing a pathway for infection.

I have tried cleaning up burns in stages on successive days. When I did this I saw that areas on which flaps of dead skin had been left to trap pockets of blister fluid were more inflamed than those which had been cleaned up a day or two earlier, but this soon subsided and final healing was not delayed.

My conclusions were that leaving blister fluid in contact with a burned area tends to keep it inflamed. On the other hand, the elaborate scrubbing of a burned patient not only increases the immediate shock, but does not accelerate the rate of healing, which seemed the same for areas where dead skin was removed at once or where it was removed two or three days later.

Manchester. S. SHUBSACHS.

MICROBIAL WARFARE

SIR,—Recently, in the lay press, reference was made to a resolution on microbial warfare which was unanimously passed at the 6th International Congress for Microbiology, at Rome, in September, 1953. On turning back to your report of the congress (Oct. 3), I note that your correspondent has omitted to record the resolution, which read as follows:

"That the 6th International Congress for Microbiology, bearing in mind the resolution approved at the 4th International Congress for Microbiology, appeals to all governments which have not as yet adhered to or ratified the Geneva Protocol of June 17th, 1925, prohibiting the use of all means of microbial warfare, to so adhere and ratify it as soon as possible."

Touching, as it does, on the moral responsibility of doctors and scientists in the use of their skills, it would seem desirable that the omission of this resolution from your columns should be rectified.

Wembley, Middlesex. G. H. LATHE.

CORTICOTROPHIN AND CORTISONE IN DERMATOLOGY

SIR,—In your annotation of Dec. 12 you say that, whereas the local application of cortisone to the skin is of no value, "there is some hope that compound F may be effective by local inunction."

It might be added, without overstating the case, that this hope is rapidly approaching fulfilment. It was recently reported [1] that of 104 infants and children with eczema, selected only on the basis of their failure to respond to other remedies, all had a clinical remission (estimated at between 75% and 100% complete) with hydrocortisone (compound F) applied in a suitable base.

These results taken in conjunction with those of Sulzberger et al.[2] and other investigators in the U.S.A. are certainly encouraging, since no-one has yet observed any ill effects resulting from such systemic absorption as may occur from the skin.

When the responsible allergen cannot be determined, hydrocortisone ointment, 2½% or 1%, is a safe and

1. *Canad. med. Ass. J.* 1954, **70**, 59.
2. Sulzberger, M. B., Whitten, V. H., Smith, C. C. *J. Amer. med. Ass.* 1953, **151**, 468.

effective method of controlling most allergic dermatoses whether atopic, contact, or iatrogenic until a natural remission occurs. The only limiting factor at present is the high price of hydrocortisone in this country and the restrictions on its use in the United Kingdom; but it cannot be long before this situation improves.

Merck & Co. Ltd., Montreal, Canada. J. H. LAURIE Medical director.

SIGN OF ASCITES

SIR,—In your issue of Dec. 12 Dr. Vakil described a sign which will be very useful for the detection of free fluid in the peritoneal sac. The reason for the reduplicated sound or even two distinct sounds on the opposite flank, when one flank is flicked or percussed, is not clear. Can it be that, when one flank is flicked or percussed, vibrations are set up in the abdominal wall as well as in the fluid in the peritoneal sac? This would explain why no double sound is heard with abdominal enlargement from other causes.

Karachi, Pakistan. H. M. GODIL.

HYPNOSIS AS A DENTAL ANÆSTHETIC

SIR,—Arising from your annotation of Jan. 23, it may be of interest that I give patients who reach medium or deep hypnosis a small card denoting this fact. Each patient is conditioned to counting up to five and so inducing autohypnosis. Pressure by a finger on the patient's forehead deepens the state; and dentists and doctors, being handed the card, can perform this simple manœuvre for painless extractions or minor surgery. Hypnosis is terminated by counting to five slowly, with suggestions of well-being, lack of bleeding, and rapid healing.[1]

Incidentally, over 60% of children can reach deep hypnosis,[2] and the figure for adults, which Kitching states is 10–40%, is probably nearer 60% than 20%.[3]

Many dental surgeons are using hypnosis, and there is the British Society of Dental Hypnotists in this country and the American Society of Psychosomatic Dentistry in the U.S.A., where much research is taking place. Authorities such as Ament,[4] Burgess,[5] Heron,[6] Samet,[7] Shaw,[8] Weinstein,[9] Wookey,[10] and many others have added much to the literature.

Midwifery is an excellent field for hypnosis, and "coma" is not necessary. The writings of DeLee,[11] Hammel,[12] Kroger and Freed,[13] Newbold,[14] Abrahamson and Heron,[15] and countless others confirm that light or medium hypnosis results in painless childbirth. Indeed, Read,[16] would have us believe relaxation only is necessary.

Interest in hypnosis is increasing. Many psychiatrists are anxious to learn the technique. Much research has taken place since the late war. Is it not time to set up a clinic for controlled research into this controversial subject?

London, W.1. GORDON AMBROSE.

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2. Bramwell, J. M. Hypnotism. Rider, 1930.
3. Le Cron, L. M., Bordeaux, J. Hypnotism Today. New York, 1949; p. 75.
4. Ament, P. *J. Dent. Med.* 1948, **3**, 3.
5. Burgess, T. O. *Brit. J. med. Hypnot.* 1951, **3**, 49.
6. Heron, W. T. *Northw. Dent.* 1949, **28**, 154.
7. Samet, S. *Brit. J. med. Hypnot.* 1950, **2**, 44.
8. Shaw, S. I. *J. Dent. Child.* December, 1951.
9. Weinstein, J. *Dent. Concepts*, July–October, 1950.
10. Wookey, E. E. *Brit. dent. J.* Nov. 1, 1938.
11. DeLee, J. B. Year Book of Obstetrics and Gynæcology. Chicago, 1938; p. 142.
12. Hammel, A. *Brit. J. med. Hypnot.* 1953, **4**, 31.
13. Kroger, W. S., Freed, S. C. Psychosomatic Gynæcology. Philadelphia and London, 1951.
14. Newbold, G. Medical Hypnosis. London, 1953; p. 174.
15. Abrahamson, M., Heron, W. T. *Amer. J. Obstet. Gynec.* 1950, **59**, 1069.
16. Read, G. D. Childbirth Without Fear. New York, 1944.

"MOLLUSCUM PSEUDOCARCINOMATOSUM"

SIR,—It occurs to me, reading the correspondence on this subject, that molluscum sebaceum should no longer be called pseudocarcinomatous, but that, when the lesion turns out to be a carcinoma, it is the carcinoma which is imitating molluscum sebaceum and might be called "pseudo" molluscum sebaceum.

In January, 1937, the late Dr. W. Freudenthal kindly saw a lady, aged 81, who during the last month or two had gradually developed a raised, brown, circular lesion on her right cheek in front of the ear; it was about the size of a silver threepenny-piece in diameter, and had apparently troubled her very little, except by its appearance.

Dr. Freudenthal thought that the little nodule had developed too quickly to be merely a "senile wart"; its horny surface was more in favour of its being a prickle-cell carcinoma than a basal-cell carcinoma. But, about two months afterwards, the lesion dried up and was shed spontaneously. I took the cast-off lesion to Dr. Freudenthal, who was much interested, and had sections cut of it. He told me, from what he could make of the microscopic sections, the lesion was a kind of wart-like nævus—that is to say, I suppose, what is popularly termed a senile wart (verruca senilis). Perfect healing was almost immediate and there was no recurrence during the fifteen remaining years of the patient's life.

The lesion in this case fits well amongst those which I would include as nævi in elderly persons. I suppose, however, that such lesions may occasionally undergo malignant transformation.

London, N.W.1. F. PARKES WEBER.

LANGUAGE OF THE HEART

SIR,—Valvotomy or valvulotomy for resection of the mitral valve is the same linguistic barbarism as, for example, appendicitis. My teacher Nothnagel struggled against this word and coined the term skolikoiditis (σκώληξ, worm). In vain! Our medical language comprehends a mass of false word-forming. At any rate, a Latin word with a Greek ending became usual in our professional volapük.

Düsseldorf. TH. OLBERT.

HISTOLOGICAL CHANGES IN ACROSCLEROSIS

SIR,—Acrosclerosis is of interest to dermatologist, physician, and surgeon. At a recent conference on the subject in Leeds it was felt that more information was required on the histological changes in this and in the allied conditions of Raynaud's disease and generalised scleroderma. Material is being collected for further investigation and it would be appreciated if colleagues, medical and surgical, who are investigating these conditions by making biopsies of skin, gut, lung, or other tissues, would send some unstained sections for this collection to the Dermatological Department, The General Infirmary at Leeds.

Leeds. JOHN T. INGRAM.

CERTIFICATES

SIR,—The implications in Mr. Van den Bergh's letter of Jan. 16 show the little trust he places in his fellow men.

Firstly, he assumes that all doctors are willing to give a certificate to the employers without any consideration. This I refute: for the honest doctor, and we are professionally so, knows the man and his home and is in a position to believe the statement made by his patient that he was ill the previous day, and is willing to certify that this is so.

Secondly, Mr. Van den Bergh implies that when a man does not present such a certificate he is necessarily an honest man who is admitting that he had no medical reason for his absence. But the explanation may be that he may prefer to lose a day's pay rather than bother his doctor to obtain such a certificate.

Thirdly, Mr. Van den Bergh assumes that anyone who asks for such a certificate is a scrimshanker and not to be believed. Many employees contracting a mild illness will stay in bed and not ask for a certificate, either for their employers or for National Insurance, in the hopes that they will be fit for work in a day or two. They would not need a certificate if Mr. Van den Bergh trusted them and believed what they said.

Redditch, Worcestershire. G. F. HENDERSON.

ON CREDULITY

SIR,—Developing the argument of his Harveian Oration—the Royal College of Physicians versus Credulity—Lord Moran at times comes perilously near to spiking his own guns.

By admitting the innate credulity of human nature he fosters the presumption of the college in making war on human nature. "The trouble was not so much that the college was alone in the fight, but rather that it was at war with human nature." Such a conflict, to be successful, calls for a worthy protagonist indeed! The aim may seem laudable, as seen in the preamble of an early 16th-century Act of Parliament which he quotes: "Forasmuch as the science and cunning of Physic . . . is daily, within the realm, exercised by a great multitude of ignorant persons . . ;" but to proceed on Gestapo or Court of Star Chamber lines, as with "Dr. Alexander Leighton a doctor of Leyden University," by secret trials and infliction of personal mutilation, smacks of low-grade intelligence, lack of imagination, and self-righteousness that augurs ill for its patrons. Yet Lord Moran quotes the incident as an occasion where "the boisterous vigour of the time did not always temper *justice* [italics mine] with mercy." I am sure he did not mean to call this justice; but, even so, justice, when dealing with an opponent, is not enough if either side is to benefit.

Surely the history of the college would have been more bright, and Lord Moran's Harveian Oration more stimulating, if instead of persecuting quacks they had at least tried to temper judgment with understanding. Credulity and Faith are very close partners; even Bishop Berkeley says:

> "You must mix some uncertainty with faith,
> if you would have faith be."

If there are, as Lord Moran says, many people who prefer to go to a quack rather than a registered medical practitioner, whose fault is it?

Lord Moran's idea of raising the standard of medicine (*a*) by improving its academic status, and (*b*) by "making the physician independent of the patient's favour" is in keeping with the worst traditions of the college. "How time and again," he says "the choicest spirits of their age frittered away their time in general practice, how even Harvey himself rode on his horse over the countryside, quieting the fears of old women . . ." If anything is more likely to put Harvey's poor ghost back into circulation I should like to hear it.—From academic medicine, a profession independent of the patient, and another set of backroom boys, "Good Lord deliver us"!

To make war on credulity and the heretic in medicine may be a worthy but it is also a very difficult, not to say undignified or embarrassing, exercise, especially as the heretic of one age tends to be the orthodox of the next. It certainly cannot be waged from the platform of self-righteousness, for the first doctor was a quack. Nor can it be waged from the laboratory or study, because our real contacts are not there; nor even yet from the ivory towers to which our colleagues might elevate us, for who then could touch the hem of our garment . . . ?

London, W.1. W. PINNINGTON JENSON.

Obituary

AUSTIN EDWIN COOPER

B.A., M.D. Dubl., L.M.

Dr. A. E. Cooper, consulting anæsthetist to the London Hospital, died on Jan. 19 at the age of 84.

He was born in Dublin and was educated at Leeson School and Trinity College, Dublin, where he took his B.A. in 1891. He continued his medical studies at Trinity College and at St. Thomas's Hospital, London, graduating as M.B. in 1895 and proceeding to his M.D. the following year. After holding house-appointments at the Adelaide Hospital in Dublin and at the Royal Pimlico Dispensary he was appointed anæsthetist to the Royal National Orthopædic Hospital, assistant anæsthetist to the West London Hospital, and later anæsthetist to the London Hospital.

He also served the Chelsea Clinical Society as treasurer and vice-president. During the late war he was appointed an anæsthetic specialist under the Emergency Medical Service, and though over 70 years of age he spent long hours in the operating-theatres at Whipps Cross Hospital.

A colleague writes: "Austin Cooper was essentially an anæsthetist of the old school and seldom departed from the methods in which he was brought up. He depended almost entirely on nitrous oxide, chloroform, and ether. Open ether was his great standby and he was a master at maintaining deep quiet anæsthesia over long periods for abdominal operations. He rarely attended meetings and wrote little; it is as a safe practical anæsthetist that he will be remembered."

Dr. Cooper married in 1898, Mary, daughter of John Hunter, of Hollybrook Park, co. Dublin. She died in 1946. There were two sons and a daughter of the marriage.

WILLIAM HENRY ROWELL

O.B.E., M.D., D.Hyg. Durh., D.P.H.

THE career of Dr. W. H. Rowell, who died at Grange-over-Sands on Jan. 4, at the age of 79, fell into two almost equal parts, for he had spent almost as many useful years in general practice as in the school health service.

After qualifying in 1895 he held house-appointments at the Royal Victoria Infirmary, Newcastle upon Tyne, and he took his M.D. Durh. in 1898 and his B.HYG. with honours the following year. He volunteered for service in the South African War and served at Kimberley and the Relief of Mafeking. On his return he was elected an honorary freeman of the City of Newcastle. The next fourteen years he spent in general practice at Grimsby. While there, he joined the local Territorials, the Lincolnshire Yeomanry. For his services during the 1914–18 war he was twice mentioned in despatches and was appointed O.B.E.

On his return in 1919 he took the D.HYG. and began what was to prove the second part of his career, when in 1920 he entered the public-health department at Stockport. He was one of the pioneers in the school health service and he served as assistant school medical officer in Stockport until 1943, when he retired.

J. Y. writes: "Dr. Rowell enjoyed his ten years of leisure, near the lakes he loved so well, in the pleasant and soft surroundings of Grange-over-Sands. These were in keeping with his own nature. He was a modest man, full of love and sympathy for his fellow men. His end came quickly with a heart attack, as he would have wished. He is survived by his wife."

ALLAN PLEDGER PIGGOT

M.R.C.S.

Dr. Piggot, formerly deputy medical superintendent of St. James' Hospital, Balham, where for over thirty years he devoted himself to research on the morbid anatomy of old age, died on Jan. 6.

He qualified from Guy's Hospital in 1903. He held appointments at several mental hospitals, including the Isle of Wight County Asylum, before he settled at St. James' Hospital in 1915. In 1919, on his return from service with the R.A.M.C., he became deputy medical

superintendent there, and soon afterwards he began his series of 10,000 necropsies on subjects over the age of sixty-five. With Dr. Trevor Howell he published the results of his observations based on this work in *Geriatrics*, from 1949 to 1953, in a collection of articles, under the general title of De Sedibus Morborum in Senectute. Modest and retiring, Dr. Piggot avoided public notice and few of his colleagues understood how much he had accomplished.

His wife survives him with a son and a daughter, Dr. Rosa Piggot, who is assistant medical officer of health for Reading.

HERBERT LESLIE MILLES
M.C., M.A. Camb., M.R.C.P.

Dr. H. L. Milles, physician to the Worcester Royal Infirmary and to the Royal Brine Baths Clinic at Droitwich, died on Jan. 18.

He took up medicine after the first world war, during which he won the Military Cross, and after studying at Cambridge and King's College Hospital he qualified in 1926. He held resident appointments there and at Edinburgh Royal Infirmary, later returning to King's as a medical registrar. He became M.R.C.P. in 1931.

A special interest in rheumatism led him to settle in Droitwich. When the second world war came, and medical practice in the spa was disorganised, he was appointed deputy medical superintendent at Barnsley Hall Emergency Hospital. With his customary enthusiasm he threw himself wholeheartedly into this new venture, acting as physician in charge of the medical division and encouraging the social life of the patients. He formed many new friendships with the Birmingham consultants who visited the hospital. In 1942 he was appointed an extra physician at the Worcester Royal Infirmary and straightaway instituted an electrocardiographic department. After a serious illness in 1947 he was allowed to resume only limited work.

A colleague writes: "Highly strung by nature, Milles was always cheerful and friendly, finding happiness in all that he did. An unusual clinical problem would assuredly excite his attention, and, disregarding the injunction of his medical advisers, he would hurry off to share the interest of it with a colleague; but never would his enthusiasm be allowed to impair his clinical judgment. He often gave an impression of being in a hurry; and indeed he walked characteristically with a slight forward stoop, as if he was trying to catch up on time. At meetings he could be relied upon to produce something of interest, but in the excitement of the moment he did not always marshal his facts to the best advantage.

"Whatever he took up he did enthusiastically." Before his illness he was a keen tennis-player, a knowledgeable and practical gardener, and an able driver of a well-proven and faithful Lancia. Latterly he confined his outdoor activities to fishing and painting, enjoying to the full the tranquillity of the nearby valley of the Teme. At home his family shared his interests: he read widely and took pleasure in his collection of gramophone records of which he was very proud."

Mrs. Milles survives him with four children.

WE record with regret the death of Mr. S. C. EAST, a valued member of the staff of THE LANCET for more than half a century. Entering our office in 1887 as a boy of 14, he became one of its main supports; and to generations of medical visitors and advertisers gave a cheerful welcome and ready help which brought him many friends. He retired in 1939 and attained his 81st year.

Births, Marriages, and Deaths

BIRTHS

EDWARDS.—On Jan. 22, at the Maternity Hospital, Leeds, to Helen (née Garner), wife of Dr. Gordon Edwards—a third daughter (Margot Lesley).

HABIBIS.—On Jan. 12, at Queen Charlotte's Hospital, to Stella M. Murray, M.B., D.C.H., wife of Dr. Homer S. Habibis, 1A, Porchester Terrace, W.2—a daughter (their fourth child).

DEATHS

WATSON.—On Jan. 20, at Del Rey House, Cheltenham, Lieut.-Colonel Charles Henry Watson, D.S.O., I.M.S. retd.

Diary of the Week

JAN. 31 TO FEB. 6

Tuesday, 2nd

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. L. P. Garrod: Causes of Failure in Antibiotic Therapy.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. J. R. Armstrong, Mr. Aleck Bourne: Backache in Women.

Wednesday, 3rd

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
5.15 P.M. *Sections of History of Medicine and Odontology.* Prof. Humphrey Humphreys: Dental Operations Practised in Primitive Communities. (C. E. Wallis lecture.)
8 P.M. *Section of Surgery.* Mr. Alan Hunt, Mr. Norman Tanner, Dr. E. R. Cullinan: Portal Hypertension.

INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. R. W. Riddell: Practical Diagnosis of Superficial Mycoses.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
5.30 P.M. Prof. P. Van de Calseyde (Bruges): Bronchial Diseases and Pathology of Upper Respiratory Tract.

MIDLAND MEDICAL SOCIETY
8.15 P.M. (Birmingham Medical Institute, 154, Great Charles Street, Birmingham, 3.) Dr. T. L. Hardy: Functional Disorders of Colon.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) *Section of Medicine.* Dr. W. H. Trethowan: Psychopathological Reactions to A.C.T.H. and Cortisone.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (Royal College of Surgeons, 18, Nicolson Street.) Dr. E. H. Cameron: Forty Years of Ophthalmology.

Thursday, 4th

ROYAL COLLEGE OF SURGEONS, Lincoln's Inn Fields, W.C.2
5.30 P.M. Prof. Geoffrey Hadfield: Co-carcinogenesis.

UNIVERSITY OF LONDON
5.30 P.M. (School of Pharmacy, 17, Bloomsbury Square, W.C.1.) Prof. J. H. Gaddum, F.R.S.: Discoveries in Pharmacology. (First of two lectures.)
5.30 P.M. (Senate House, W.C.1.) Air Marshal Sir Harold Whittingham: Medical Science and Problems of Flying.
5.30 P.M. (University College, Gower Street, W.C.1.) Prof. F. Bergel, D.SC.: Chemical Aspects of Abnormal Growth. (First of two lectures.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Prof. A. A. Miles: Reactions to Bacterial Invasion.

INSTITUTE OF CHILD HEALTH, The Hospital for Sick Children, Great Ormond Street, W.C.1
5.30 P.M. Mrs. J. M. Williams: Prevention of Backwardness at School.

MANCHESTER MEDICAL SOCIETY
8 P.M. *Section of Anæsthetics.* Dr. E. A. Pask: James Brown.

Friday, 5th

UNIVERSITY OF LONDON
5.30 P.M. (17, Bloomsbury Square, W.C.1.) Professor Gaddum: Discoveries in Pharmacology. (Second of two lectures.)

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Mr. J. E. Richardson: Unusual Presentation of Common Gastric Disorders.

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Section of Otology.* Mr. Terence Cawthorne, Dr. A. B. Hewlett: Ménière's Disease.
2.30 P.M. *Section of Laryngology.* Miss M. D. Snelling, Mr. Victor Lambert: Treatment of Carcinoma of Nasopharynx.
5.30 P.M. *Section of Anæsthetics.* Dr. J. G. Bourne: General Anæsthesia for Outpatients with special reference to Dental Extraction.

INSTITUTE OF CARDIOLOGY, National Heart Hospital, Westmoreland Street, W.1
9.30 A.M. Dr. Stanley J. Sarnoff (Harvard): Hæmodynamic Effects of a New Sympathomimetic Amine and its Use in Myocardial Infarction.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Gordon: Benign New Growths.

INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5 P.M. Prof. H. Gastaut (Marseilles): So-called "Psychomotor" and "Temporal" Epilepsy.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY, Whipps Cross Hospital, E.11
8.30 P.M. Dr. Hugh Ramsay: Tuberculosis Services, Yesterday and Today.

Saturday, 6th

MIDLAND TUBERCULOSIS SOCIETY
8.15 P.M. (151, Great Charles Street, Birmingham, 3.) Mr. P. R. Allison: Diseases at the Lower End of the Œsophagus.

KENT PAEDIATRIC SOCIETY
2.15 P.M. (Royal Star Hotel, Maidstone.) Mr. Robert Percival, Dr. P. N. Swift: Circumcision.

Notes and News

CLASSIFICATION OF PROPRIETARY MEDICINES

LAST July the Joint Committee on Prescribing, under the chairmanship of Sir Henry Cohen, issued a classified list of proprietary medicines as a guide to prescription under the National Health Service.[1] A list of alterations and additions has now been published.

EPIDEMIC HÆMORRHAGIC FEVER

AT the meeting of the Royal Society of Tropical Medicine and Hygiene on Jan. 21, Lieut.-Colonel K. P. Brown and Dr. A. Knudsen read papers on epidemic hæmorrhagic fever.

Lieut.-Colonel Brown described the clinical course of the disease: the invasion phase, in which evidence of renal damage appeared, was followed by a toxic phase when the temperature fell, the patient's condition deteriorated, and there was usually hypotension and reduction in the circulating plasma-volume, with œdema and hæmorrhages which might be severe. Most patients started to recover as this condition of shock regressed, but there was commonly an oliguric phase in which the blood-pressure rose to hypertensive levels. This was usually followed by diuresis and recovery. There was no specific treatment. The mortality was about 5%.

Dr. Knudsen described the pathology of this strange disease: the essential microscopic lesions were hæmorrhages in the medulla of the kidney (with ischæmic necrosis), the suprarenal, the pituitary, the heart muscle, and other organs. But there was no inflammatory reaction, and cellular infiltration was rare and, even where it did occur, scanty. The immediate cause of death in fatal cases was usually peripheral circulatory collapse. Bacteriological findings have been consistently negative, but Russian workers claimed to have transmitted one of this group of diseases to human volunteers.

Various theories on the ætiology and transmission of this disease, and of other diseases which closely resemble it, have been proposed, but the general opinion of the meeting was that the cause was still a mystery. If it is an infection due to a micro-organism, why are there no signs of inflammation? If it is a toxin (and a parallel with tick paralysis was suggested), why is there an incubation period which, in one case, was 30 days?

Answering a question, Lieut.-Colonel Brown said that he had not heard of a second attack in any patient. Brigadier F. J. O'Meara pointed out that the epidemics in Korea tended to occur in two waves—May–June and December–January—at seasons when mite-counts on rodents had just passed their peak.

PREVENTIVE MEDICINE AND THE HOSPITAL

LAST May the 8th International Hospital Congress met in London,[2] and now the International Hospital Federation has published a report of the proceedings[3] at this lively gathering. The subject of the congress was Preventive Medicine as a Major Function of the Hospital, and its Implications. The report contains a verbatim account of the plenary sessions and the sectional group meetings. When he opened the congress, the Minister of Health, Mr. Iain Macleod, said that he had read in advance four of the addresses to be given to the congress and he had been enthralled with their freshness: "here," he said, "was a new breeze blowing down the rather dusty corridors of our long debates on health." The published proceedings will help those who were present to refresh the stimulus of this international debate, and those who were not there will be able to catch up with some of the nimblest thinkers on this subject.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

IN the report on the work of the school for 1952–53, the dean, Dr. Andrew Topping, tells of continued development both in routine teaching and in research. The three courses conducted at the school, for the diplomas in public health, bacteriology, and tropical medicine and hygiene, have had full complements of students, including many from overseas; and, quite apart from their academic advantages, the courses have promoted valuable international contacts. In the school's department of public health, under the direction of Prof. J. M. Mackintosh, one aim of the course is to train students to appreciate the value of team-work; and, with this in mind, the system of group study has been made a feature of the course for the D.P.H. The daily period of lectures for the D.P.H. has been much reduced in recent years and the students, whose average age is 33, are given more time for less formal study: they give dissertations on subjects of their own choice, and they keep "day-books" in which they enter critical notes on their own reading and on visits to places of public-health importance outside the school. Summing up the purpose of the novel teaching methods in use in his department, Professor Mackintosh says that their aim is to make good general physicians in preventive medicine; the course is designed to be "the gateway to a career, not the badge of a specialty."

ERYTHROMYCIN

SMALL amounts of erythromycin have lately been made available by the Ministry of Health to hospitals in the National Health Service. Soon, this antibiotic will be freely available on prescription and the Ministry is therefore sending to all hospitals a note, prepared by the Medical Research Council, in which the indications for the use of erythromycin and the precautions which should be taken are set out. Erythromycin has a range of activity similar to that of penicillin and has been shown to be effective in acute infections due to hæmolytic streptococci, pneumococci, and staphylococci. Organisms resistant to all other antibiotics are nevertheless sensitive to it: hence its greatest value is in treating staphylococcal infections not responsive to other drugs, the frequency of which, particularly in hospitals, is showing a disturbing increase. Erythromycin is itself a drug to which bacterial resistance can be acquired rather rapidly, and the note, urging its cautious use, points out that it might be disastrous if a staphylococcal population were built up which was resistant to erythromycin as well as to earlier antibiotics. Penicillin should always be given when it will serve equally well.

OBSTETRIC ANALGESIA

Imperial Chemicals (Pharmaceuticals) Ltd. have produced a film illustrating some technical points in the use of inhalation analgesia in obstetrics. In a spoken introduction to a preview in London it was explained that it should be regarded as only supplementary to teaching which pupil midwives and medical students receive elsewhere, and for this purpose it has the merit of making its points clearly, with expert use of animated diagrams. Where it lies chiefly open to criticism is in its title—for it does not set out to cover the whole subject of *The Relief of Pain in Childbirth*—and perhaps in its insistence that inhalation methods approach most nearly to the ideal in obstetric analgesia. Probably most doctors who work daily among women in labour would say that if they had to limit themselves to a single analgesic, they would choose pethidine—a drug which midwives are now allowed to use in certain prescribed doses but which they seem reluctant to adopt. "Severe toxæmia," but not fœtal distress, is given as a contra-indication to gas-and-air analgesia; the effects of quite deep anæsthesia are shown, perhaps unnecessarily; and practical management is touched on somewhat lightly. For these reasons the emphasis must, as was suggested, be on the use of this film as a supplement to other and wider teaching.

STERILITY IN MAN

THE past decade has witnessed the advent and perfection of several new and powerful aids to biological and clinical research on male sterility, and the need has long been felt for a book which would give a general appreciation of the entire problem of male sterility and at the same time provide an account of the most recent advances. This gap has been filled by the French Urological Association in publishing a monograph by Dr. Henri Bayle and Dr. C. Gouygou.[1] Dr. Bayle's name is well known to British specialists in this field, many of whom heard his excellent lectures at the conference of the Society for the Study of Fertility in London in 1952, when he spoke on azoospermia of excretory origin and electron-microscope studies of human spermatozoa.[2] The new monograph, in discussing the diagnosis and treatment of male subfertility and sterility, includes a description of his technique of vaso-epididymostomy for the relief of obstructive azoospermia in man.

1. See *Lancet*, 1953, ii, 194.
2. *Ibid*, 1953, i, 1085.
3. Proceedings of the 8th International Hospital Congress. Obtainable from the International Hospital Federation, 10, Old Jewry, London, E.C.2. Pp. 362. 30s.

1. La stérilité masculine. Paris: Association Française d'Urologie. 1953.
2. Bayle, H. *Proc. Soc. Stud. Fertility*, 1952, **4**, 27, 30.

University of Birmingham

Dr. Paul Younge (Harvard Medical School) has been appointed Ingleby lecturer for 1954. Dr. J. Hardwicke has been appointed lecturer in experimental pathology.

The following degrees have been conferred:

M.D.—R. A. M. Case (with honours).

M.B., Ch.B.—A. R. M. Bateman, Mary Bennett, Sidney Blumenthal, Gillian M. Bradley, A. D. Breward, John Coia, R. R. Dieffenthaller, B. G. Dudley, Hilary J. Evans, H. W. Fladee, O. C. Forbes, D. D. Foster, J. C. F. Healey, D. R. Knapp, Joyce B. H. Longmore, Jean M. MacDonald, N. T. McLaughlin, A. C. Marshall, J. W. Moss, J. G. Powell, P. M. Sullivan, Jack Walker, Beryl E. Wallbank.

Medical Research Council

The council invite applications for the following fellowships for 1954–55:

Rockefeller Travelling Fellowships.—These fellowships are intended for graduates resident in this country who have had some training in research work in clinical medicine or surgery, or in some other branch of medical science, and who are likely to profit by a period of work at a centre in the United States or elsewhere abroad, before taking up positions for higher teaching or research in the United Kingdom. Fellowships tenable in the United States will normally carry a maintenance allowance at the rate of $2700 per annum for a single fellow and $3600 per annum for a married fellow. Provision will also be made for travelling and other approved expenses.

Eli Lilly Travelling Fellowships.—These fellowships, tenable in the United States are offered on terms and conditions similar to those attaching to the Rockefeller fellowships.

Dorothy Temple Cross Research Fellowships in Tuberculosis.—These fellowships offer special opportunities for study or research to British doctors who "intend to devote themselves to the advancement by teaching or research of curative or preventive treatment of tuberculosis." The fellowships will, as a rule, be awarded to candidates who wish to make their studies or inquiries elsewhere than in the United Kingdom. They provide for the payment of a maintenance allowance at the rate of £650 per annum for a single fellow and £900 per annum for a married fellow. An allowance will be made for travelling and other approved expenses.

Further particulars and forms of application may be obtained from the secretary of the council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged not later than March 15.

Course in Criminology

The fourth International Course in Criminology, organised by The International Society of Criminology, with the support of UNESCO, is to be held in London from March 24 to April 13, under the direction of Dr. Denis Carroll and Mr. Hermann Mannheim, DR. JURIS. The fee for the course is £7, and applications should be sent before Feb. 14, c/o I.S.T.D., 8, Bourdon Street, Davies Street, London, W.1.

North of England Obstetrical and Gynæcological Society

At the annual general meeting of this society on Jan. 15, the honorary fellowship was conferred on Sir William Fletcher Shaw, Dr. Henry Brown, and Dr. W. A. MacKay, all of whom have been members for over 45 years.

The following officers were elected for 1954: president, Dr. K. V. Bailey; hon. treasurer, Dr. C. H. Walsh; hon. general secretary, Mr. D. C. Racker; hon. reporting secretary, Mr. S. Bender.

World Congress of Cardiology

The second World Congress of Cardiology will be held from Sept. 12 to 17, in Washington, D.C., as a combined meeting with the 27th scientific sessions of the American Heart Association under the presidency of Dr. Paul D. White. Further particulars may be had from Dr. L. W. Gorham, secretary-general of the congress, 44, East 23rd Street, New York 10, N.Y.

European Association against Poliomyelitis

A symposium on the hospitalisation of poliomyelitis during the acute phase will be held at the Clinique Médicale des Enfants, 149, rue de Sèvres, Paris, on April 8 and 9. Further information can be had from the secretary-general of the association, 130, Rue de Linthout, Brussels.

Harmful Materials in Industrial Atmospheres

At a conference on this subject to be held by the British Occupational Hygiene Society at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, on April 6, at 11 A.M., Dr. M. W. Goldblatt will speak on the Investigation of Atmospheric Contaminants in Factories; Dr. B. M. Wright on the Measurement of Dust Exposure. The conference fee for non-members of the society is 12*s.* 6*d.* Further details may be had from the hon. secretary, Mr. P. C. G. Isaac, Public Health Engineering Laboratory, King's College, Newcastle upon Tyne, 1.

Cortisone and Corticotrophin

On the advice of the Medical Research Council, the Ministry of Health has decided to add acquired hæmolytic anæmia and thrombocytopænic purpura to the list of "obligatory conditions" for which cortisone and corticotrophin (A.C.T.H.) will be made freely available at the special centres.

Ehrlich Centenary

The work of Paul Ehrlich and Emil von Behring will be celebrated at Frankfurt on March 14, the 100th anniversary of Ehrlich's birthday, when the Paul Ehrlich-Ludwig Darmstädter prize will be presented to Prof. E. B. Chain, F.R.S.

Association International pour l'Étude des Bronches

The fourth congress of this association will be held at Geneva on June 5 and 6. Further particulars may be had from Prof. A. Montandon, Hôpital Cantonal, Geneva, Switzerland.

"Animal, Vegetable, Mineral"

The Wellcome Historical Medical Museum is the challenger in the next edition of this programme to be televised on Feb. 4. The experts who will be called on to identify unusual objects from the museum include Mr. Julian Huxley, F.R.S., and Prof. J. Z. Young, F.R.S.

A Holiday Home for Handicapped Children

The Invalid Children's Aid Association's John Horniman Home at Worthing, Sussex, from next April will admit children (girls 7–16, boys 7–14) who need holidays, or care in family crises, but who are so severely handicapped that they cannot be received in ordinary convalescent homes. Inquiries should be sent to the general secretary, Miss Rattenbury, 4, Palace Gate, London, W.8.

Central Council for Health Education

The subject of the seminar organised by the council this year for medical officers of health is to be Foot Health. It will be held at St. John House, Collingham Gardens, London, S.W.5, from Feb. 23 to 27.

Mr. T. T. Stamm will give the opening lecture on the Development and Function of Feet, and there will be a discussion on the Foot Defects—Where does the Cause Lie? Further particulars may be had from the council, Tavistock House, London, W.C.1.

Directory of Convalescent Homes.—The 1954 edition of this directory has now been published. It gives particulars of the convalescent homes serving Greater London, and the geographical index and the classified index will make it easier for the doctor to select a home suitable to each patient's needs. Copies of the directory may be had from King Edward's Hospital Fund, 10, Old Jewry, E.C.2 (7*s.* 6*d.* post free).

CORRIGENDUM: *Mental Nursing.*—At the conference which we reported last week (p. 204), Mrs. B. A. Bennett (principal nursing officer, Ministry of Labour and National Service) said that until 1962 we shall have 100,000 fewer girls reaching the age of 18 every year, as compared with 1939. Our report gave the figure 10,000.

Sir Cecil Wakeley, F.R.C.S., has returned from his two-month visit to Ceylon and the Middle East.

Appointments

BURKITT, E. A., M.R.C.S., D.P.M.: asst. psychiatrist, Hellesdon Hospital, Norwich.

Colonial Service:

ASHE, GEOFFREY, M.B. Manc., D.T.M. & H.: M.O. (tuberculosis), Aden.

CONNOLLY, MAUREEN, M.B. Edin., M.R.C.O.G., D.C.H.: M.O., Kenya.

DA COSTA, A. B., M.B. Edin., M.R.C.P.E.: senior physician, British Guiana.

GURD, C. H., M.B. Brist., M.R.C.P.: physician specialist, Fiji.

HOLDEN, J. S., M.B. Edin.: M.O., Uganda.

LARSON, A. G., M.B. Durh.; M.O., Fiji.

MCCRIRICK, G. Y., M.B. Glasg.: M.O., Fiji.

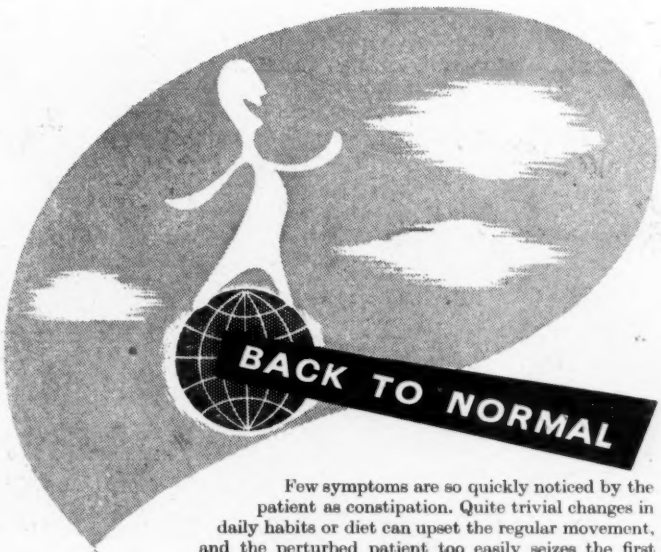
MACKAY, D. H., M.R.C.S., D.P.H.: senior M.O., Kenya.

MCKINNON, J. A., M.B. Glasg.: M.O., Kenya.

ROBERTSON, M. J., M.R.C.S.: M.O., Federation of Malaya.

WILLIAMS, A. E. O., L.R.C.P.I.: M.O., Sierra Leone.

ZAMMIT, FRANCIS, M.D. Malta: M.O., Nigeria



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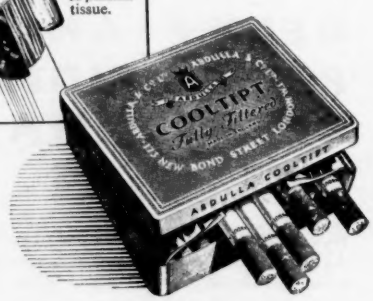

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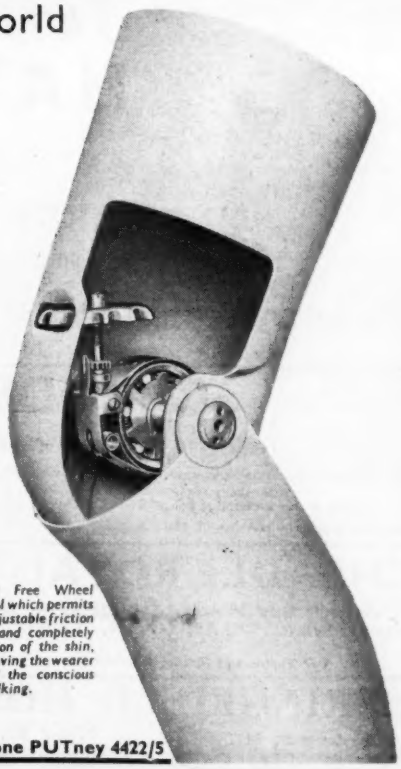

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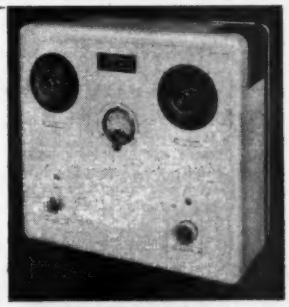

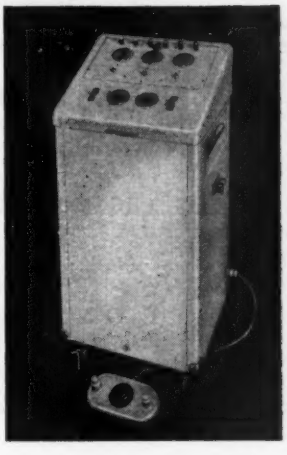

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 33

ANÆSTHETICS
West London, W.6. H.O. 36
Barnsley. Beckett. Reg. 37
Blackburn & Dist. H.M.C. Sr. H.O. 38
Blackpool. Victoria. Sr. H.O.'s .. 38
Bradford. St. Luke's. H.O. 39
Dudley, Stourbridge & Dist. Sr. H.O. 40
Glasgow Royal Infy. Sr. H.O. .. 41
Harold Wood, Essex. Reg. 41
Hillingdon, Middx. Sr. Reg. .. 41
Ilford. King George. Sr. H.O. .. 41
Manchester United Hosps. H.O. & Sr. H.O. 43
Manchester United Hosps. Reg. .. 42
Manchester. West Manchester H.M.C. Sr. H.O. 43
North West Met. R.H.B. P.-t. Cons. 35
Plymouth. South Devon & East Cornwall. H.O. 44
Sheffield R.H.B. Locum Reg. .. 45
Sheffield R.H.B. Sr. H.M.O. 35
Stafford H.M.C. Sr. H.O. 46
Stockport & Buxton H.M.C. Sr. H.O.'s 46
Swansea. Sr. H.O. 47
Welsh R.H.B. Cons. 35
York County, City & Military. Sr. H.O. 48
Northern Ireland Hosps. Auth. Cons. 35

CASUALTY
Hackney, E.9. H.O. 36
Metropolitan, E.8. Sr. H.O. 36
Paddington Green Children's, W.2. H.O. 36
Royal Free, W.C.1. Sr. H.O. 36
Royal Northern, N.7. H.O. 36
Birmingham. Selly Oak. Sr. H.O. .. 38
Blackpool. Victoria. H.O. 38
Burton-on-Trent Gen. Infy. Jr. H.M.O. & Locum H.O. 38
Bury St. Edmunds. West Suffolk Gen. Sr. H.O. 39
Cambridge. Addenbrooke's. Sr. H.O. 39
Dudley, Stourbridge & Dist. Sr. H.O.'s 40
Hastings. Royal East Sussex. Sr. H.O. 41
Hounslow. Middx. Sr. H.O. 41
Maidstone. West Kent Gen. Sr. H.O. 43
Newcastle Gen. Sr. H.O. 44
Orpington. Kent. Sr. H.O. 44
Portsmouth Group H.M.C. Sr. H.O. 44
Salford Royal. Pre-reg. H.O. .. 45
Salisbury Gen. Sr. H.O. 45
Sheffield. City Gen. Regs. 45
Sheffield R.H.B. Locum Reg. .. 45
Sheffield R.H.B. Sr. H.M.O. 35
Sidcup, Queen Mary's. Sr. H.O. .. 46
Stafford. Staffordshire Gen. Infy. Jr. H.M.O. 46
St. Albans City. Reg. (Temp.) .. 46
Swindon Hosp. Group. Sr. H.O. .. 45

CHEST AND TUBERCULOSIS
Brompton. S.W.3. H.O.'s 35
Central Middlesex, N.W.10. H.O. .. 35
London Chest. H.O.'s 36
Ashford, Middx. Reg. 37
Birmingham R.H.B. Sr. H.M.O.'s .. 34
Bishop's Stortford. Haymeads. Sr. H.O. 38
Bradford Royal Infy. Sr. H.O. .. 39
Bromsgrove. Reg. Thoracic Surgical Centre. H.O. 39
Cottingham. Castle Hill. Sr. H.O. .. 39
Cottingham. Raywell San. Sr. H.O. 40
Dudley, Stourbridge & Dist. Sr. H.O. 40
East Anglian R.H.B. Sr. H.M.O. .. 35
Leicester Isolation Hosp. & Chest Unit. Reg. 42
Liverpool. Broadgreen. Sr. H.O.'s. . 42
Maidstone. Preston Hall. Sr. H.O. .. 43
Manchester R.H.B. Regs. 43
Market Drayton. Cheshire Joint San. Jr. H.M.O. or Sr. H.O. 44
Scotland. South-Eastern R.H.B. Reg. 45
St. Helens. Eccleston Hall. Sr. H.O. 46
Ventnor, I.W. Royal Nat. Hosp. for Diseases of Chest. Sr. H.O. .. 47

DENTAL SURGERY
Scotland. Western R.H.B. Sr. H.M.O. 35

EAR, NOSE, AND THROAT
North West Met. R.H.B. P.-t. Cons. 34
Royal Free, W.C.1. Sr. Reg. .. 36
St. Mary's, W.2. P.-t. Reg. 37
Birmingham United Hosps. H.O. .. 38
Dartford H.M.C. Sr. H.O. 40
East Cumberland H.M.C. H.O. .. 40
Exeter. Royal Devon & Exeter. Sr. H.O. 40
Ipswich. East Suffolk & Ipswich. H.O. 41
Manchester R.H.B. Regs. 43
Manchester. South Manchester H.M.C. Sr. H.O. 43
Manchester. West Manchester H.M.C. Pre-reg. H.O. 43
Newport, Mon. Royal Gwent. Jr. H.M.O. 44
Nottingham Gen. Sr. H.O. 44
Salford Royal. Pre-reg. H.O. .. 45
Southampton. Royal South Hants & Southampton Gen. Sr. H.O. .. 46
Wolverhampton H.M.C. H.O. .. 48

GERIATRICS
Hornchurch. St. George's. Jr. H.M.O. 41
Isleworth. West Middlesex. H.O. .. 41
Orpington. Kent. Sr. H.O. 44

INFECTIOUS DISEASES
Brook Gen., S.E.18. H.O. 35
Eastern (Fevers), E.9. Sr. H.O. .. 35
Birmingham R.H.B. Reg. 37
Derby. Derwent. Reg. 40
Lancaster. Beaumont. Jr. H.M.O. .. 42
Leeds R.H.B. Reg. 42
Scotland. Western R.H.B. Reg. .. 45
Waltham Abbey, Essex. Honey Lane. Jr. H.M.O. 47

MEDICINE
Central Middlesex, N.W.10. H.O. .. 35
Hammersmith, W.12. Sr. H.O. .. 36
New End, N.W.3. H.O. 36
Bishop's Stortford & Dist. H.O. .. 38
Bishop's Stortford. Haymeads. H.O. 38
Bournemouth. Christchurch. Reg. .. 38
Bury & Rossendale H.M.C. Sr. H.O. 38
Carmarthen. West Wales Gen. H.O. 39
Coventry Group 20 H.M.C. Sr. H.O. & Jr. H.M.O. 39
Croydon. Mayday. H.O. 40
Dartford H.M.C. H.O. 40
Dudley, Stourbridge & Dist. Sr. H.O. 40
Edgware Gen. H.O.'s 40

(continued overleaf)

Edinburgh. Chalmers. H.O. .. 40
Enfield War Mem. Sr. H.O. 40
Glasgow. Foresthall. Jr. H.M.O.'s .. 41
Haverfordwest. Pembroke County War Mem. H.O. 41
Hillingdon, Middx. H.O. 41
Huddersfield Royal Infy. H.O. .. 41
Hull. Kingston Gen. H.O. 41
Keighley & Dist. Victoria. H.O. .. 42
Kettering & Dist. H.M.C. Sr. H.O. .. 41
Leamington Spa. Warneford Gen. Pre-reg. H.O. 42
Leeds R.H.B. Reg. 42
Manchester United Hosps. Sr. Reg. 43
Nottingham City. H.O. 44
Peterborough Mem. H.O. 45
Poole Gen. H.O. 44
Portsmouth Group H.M.C. Sr. H.O. & Pre-reg. H.O. 44
Romford. Rush Green. H.O. .. 45
Scotland. South-Eastern R.H.B. Reg. 45
Scotland. West Fife Hosps. B.O.M. H.O.'s 45
Scunthorpe War Mem. Sr. H.O. .. 45
Sheffield R.H.B. Sr. H.M.O. .. 35
Sheffield United Hosps. Reg. or Sr. H.O. 45
St. Albans City. Reg. 46
St. Helens & Dist. H.M.C. H.O.'s .. 46
Stoke-on-Trent. City Gen. Pre-reg. H.O.'s 46
Swansea. Mount Pleasant. Jr. H.M.O. 46
Tunstall. Burslem, Haywood & Tunstall War Mem. H.O. 47
Tynemouth Victoria Jubilee Infy. Sr. H.O. 47
Weston-super-Mare Gen. H.O. .. 47

NEUROLOGY

National Hosp. for Nervous Diseases. Reg. 36
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Sr. H.O. 37
Swansea. Morriston. Sr. H.O. .. 47

NEUROSURGERY

Guy's-Maudsley Neurosurgical Unit. Sr. H.O. 35
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. Jr. H.M.O. 37
Newcastle Gen. Sr. H.O. 44

OBSTETRICS AND GYNÆCOLOGY

Camberwell Hosps. M.C. H.O.'s .. 35
Elizabeth Garrett Anderson, N.W.1. H.O. 35
Hackney, E.9. H.O.'s. 36
Hosp. for Women, W.1. Sr. H.O. .. 36
Hosp. of St. John & St. Elizabeth, N.W.8. H.O. 36
Mothers' (Salvation Army), E.5. H.O.'s 36
North East Met. R.H.B. P.-t. Cons. .. 34
Queen Mary's Hosp. for East End, E.15. H.O. 36
St. Nicholas, S.E.18. H.O. 37
Bedford Gen. Locum Sr. H.O. .. 38
Birmingham R.H.B. Reg. 37
Birmingham. Solihull. Sr. H.O. .. 38
Bournemouth. Royal Victoria. H.O. 38
Cambridge. Addenbrooke's. H.O. .. 39
Cardiff. St. David's. H.O. 39
Coventry Group 20 H.M.C. H.O. .. 39
East Cumberland H.M.C. H.O. .. 40
Exeter. Royal Devon & Exeter. H.O. 40
Manchester United Hosps. Sr. H.O. & H.O.'s 43
Northallerton H.M.C. Sr. H.O. .. 44
North West Met. R.H.B. P.-t. Cons. 35
Plymouth. South Devon & East Cornwall. Sr. H.O. & H.O. 44
St. Albans City. Jr. H.M.O. 46
Swansea. Mount Pleasant. Sr. H.O. 47
Windsor. King Edward VII. H.O. .. 47
Wolverhampton H.M.C. H.O.'s .. 48

OPHTHALMOLOGY

Royal Eye, S.E.1. Sr. H.O.'s. 36
St. Thomas's, S.E.1. Sr. P.-t. Reg. .. 36
Aylesbury. Royal Bucks & Assoc. Hosps. M.C. H.O. 37
Birmingham R.H.B. P.-t. Cons. .. 34
Birmingham R.H.B. Reg. 37
Manchester R.H.B. P.-t. Cons. .. 35
Manchester. Royal Eye. Sr. H.O. .. 43
Romford. Oldchurch. Sr. H.O. .. 45
Scotland. Western R.H.B. Sr. H.M.O. 35
Southampton Eye. Sr. H.O. 46
Wolverhampton H.M.C. H.O. .. 48

ORTHOPÆDICS

Hammersmith, W.12. H.O. 36
Royal Northern, N.7. Sr. H.O. .. 36
Birmingham. Royal Orthopædic. Sr. H.O. 38
Blackburn Royal Infy. Sr. H.O. .. 38
Blackpool. Victoria. Sr. H.O. .. 38
Bournemouth & East Dorset H.M.C. Reg. 38
Bournemouth. Royal Victoria. Sr. H.O. 38
Bradford Royal Infy. Sr. H.O. & H.O. 39
Braintree. Black Notley. H.O. .. 39
Bridgend Gen. H.O. 39
Coventry Group 20 H.M.C. Sr. H.O. or H.O. & Sr. H.O. 39
Dartford H.M.C. Sr. H.O. 40
East Cumberland H.M.C. Sr. H.O. .. 40
Leeds R.H.B. Regs. 42
Leeds (nr.). Woodlands Orthopædic. Sr. H.O. 42
Nottingham Gen. Sr. H.O. 44
Portsmouth Group H.M.C. Sr. H.O. 44
Reading. Royal Berks & Battle Hosps. H.O.'s 45
Salford Royal. Sr. H.O. 45
Sheffield. King Edward VII Orthopædic. Locum Sr. H.O. 45
Southampton. Royal South Hants. Sr. H.O. & H.O. 46
Stoke-on-Trent. North Staffs Royal Infy. Sr. H.O. & H.O. 46
Swansea. Morriston. Sr. H.O. .. 47
Winchester. Royal Hants County. Sr. H.O. 47
Wolverhampton H.M.C. Sr. H.O. or H.O. 48
Yorkshire. East Riding H.M.C. Sr. H.O. 48

PÆDIATRICS

Ashton, Hyde & Glossop H.M.C. H.O. 37
Birmingham. Little Bromwich. H.O. 38
Birmingham R.H.B. Reg. 37
Bradford Child's. H.O. 39
Carshalton. Queen Mary's Hosp. for Child. Sr. H.O. 39
Cheltenham Gen. Eye & Child's. H.O. 39
Hereford. Gen. H.O. 41
Leeds R.H.B. Regs. 42
Nottingham Child's & City Hosps. Reg. 44
Reading. Royal Berkshire. H.O. .. 45
Sheffield United Hosps. Reg. .. 45
Winchester. Royal Hants County. H.O. 47

PATHOLOGY

St. Mary's, W.2. P.-t. Sr. Reg. .. 37
Bishop's Stortford. Haymeads. Sr. H.O. 38
Liverpool R.H.B. Sr. H.M.O. .. 34
Newcastle R.H.B. Reg. 43
North East Met. R.H.B. Sr. H.M.O.'s 34
Wolverhampton H.M.C. Jr. H.M.O. .. 48

PLASTIC SURGERY

Glasgow Royal Infy. Sr. H.O. .. 41

PSYCHIATRY

The Priory, S.W.15. Sr. Asst. R.M.O. 34
Birmingham (Mental A) Group. Sr. H.O. 37
Birmingham R.H.B. Cons. 34
Brentwood. Warley. Jr. H.M.O. .. 39
Cambridge. Fulbourn. Sr. H.O. .. 39
Dundee Mental. Jr. H.M.O. 40
Epsom. St. Ebba's. Reg. 41
Lancaster Moor. Reg. 42
Leeds R.H.B. Sr. Regs. 42
Lincoln. Bracebridge Heath. Locum Jr. H.M.O. & Jr. H.M.O. 42
Liverpool R.H.B. Sr. H.M.O. .. 34
Portsmouth. St. James. Jr. H.M.O. 44
Sheffield R.H.B. Locum Sr. H.M.O. 35
Sheffield R.H.B. P.-t. Cons. 35
St. Albans. Shenley. Reg. 46
Wickford, Essex. Runwell. Sr. H.O. 48
Wigan & Leigh H.M.C. Sr. H.O. .. 47
Yorkshire. East Riding H.M.C. H.O. 48
New York. Albany. Residencies .. 48

RADIOLOGY

National Hosps. for Nervous Diseases. Sr. Reg. 36
North West Met. R.H.B. Sr. H.M.O. 34
Colchester. Essex County. Locum Sr. Reg. 39
Leeds R.H.B. Sr. Reg. 42

RADIOTHERAPY

Hammersmith, W.12. H.O. 36
Northwood, Middx. Mount Vernon. H.O. 44

RHEUMATOLOGY

Tanlow. Canadian Red Cross Mem. Reg. 47

SURGERY

Dulwich, S.E.22. H.O. 35
King's College, S.E.5. Reg. 36
New End, N.W.3. Reg. 36
Prince of Wales's Gen., N.15. H.O. .. 36
Royal Northern, N.7. H.O. 36
South East Met. R.H.B. Reg. .. 37
St. Nicholas, S.E.18. Sr. H.O. .. 37
Aberystwyth Gen. Pre-reg. H.O. & Sr. H.O. 37
Ashford, Middx. H.O.'s 37
Ashington, Northumberland. Sr. H.O. 37
Ashton, Hyde & Glossop H.M.C. Sr. H.O. & Pre-reg. H.O. 37
Barnstaple. North Devon Infy. H.O. 37
Bexhill-on-Sea, Sussex. H.O.'s .. 37
Birmingham Accident Hosp. & Rehab. Centre. H.O.'s 37
Birmingham R.H.B. Reg. 37
Birmingham. Solihull. Sr. H.O. .. 38
Blackburn & Dist. H.M.C. H.O.'s .. 38
Blackpool. Victoria. H.O.'s .. 38
Bournemouth. Royal Victoria. H.O. 38
Bradford Royal Infy. H.O. 39
Braintree. Black Notley. Sr. H.O. .. 39
Burton-on-Trent Gen. Infy. H.O.'s. . 38
Caerphilly District. Sr. H.O.'s .. 39
Cheltenham Gen. H.O. 39
Colchester H.M.C. H.O. 39
Coventry Group 20 H.M.C. Sr. H.O. 39
Darlington Mem. H.O. 40
Dartford H.M.C. H.O. 40
Dewsbury Gen. Sr. H.O. 40
Dover. Royal Victoria. H.O. .. 40
Dudley, Stourbridge & Dist. Sr. H.O.'s & Pre-reg. H.O. 40
East Cumberland H.M.C. H.O.'s 40
Edinburgh. Chalmers. Sr. H.O. & H.O. 40
Enfield. Chase Farm. H.O. 40
Exeter City. H.O. 40
Folkestone. Royal Victoria. H.O. & Sr. H.O. 40
Gt. Yarmouth & Gorleston Gen. H.O.'s or Sr. H.O.'s 41
Halifax Royal Infy. Sr. H.O. .. 41
Hastings. Royal East Sussex. H.O. .. 41
Haverfordwest. Pembroke County War Mem. H.O. 41
Hemel Hempstead. West Herts. Pre-reg. H.O. 41
Hitchin. Lister. H.O. 41
Huntingdon County. H.O. 41
Keighley & Dist. Vic. H.O.'s. 42
Kettering & Dist. Gen. H.O. .. 41
Leeds R.H.B. Regs. 42
Lincoln County. Reg. 42
Llanelly. Jr. H.M.O. 42
Maidstone. West Kent Gen. Pre-reg. H.O. 43
Manchester. Altrincham Gen. Sr. H.O. or H.O. 43
Manchester. Ancoats. Pre-reg. H.O. 43
Manchester. Booth Hall Child's. H.O. & Sr. H.O.'s 43
Manchester R.H.B. Reg. 43
Manchester. West Manchester H.M.C. H.O. 43
Newton Abbot. S. Devon. Sr. H.O. 44
Nottingham City. H.O. 44
Nottingham Gen. Sr. H.O. 44
Perth. County & City Gen. Hosps. H.O. 44
Plymouth. South Devon & East Cornwall. H.O.'s 44
Portsmouth Group H.M.C. Pre-reg. H.O.'s 44
Romford. Oldchurch. H.O.'s. 45
Scotland. West Fife Hosps. B.O.M. H.O.'s 45
Scotland. Western R.H.B. Cons. .. 35
Scunthorpe & Dist. War Mem. Reg. 45
Southport & Dist. H.M.C. Sr. H.O.'s 45
South West Met. R.H.B.. P.-t. Cons. 34
St. Albans City. H.O. 46
St. Helens & Dist. H.M.C. H.O.'s .. 46
Stockport. Stepping Hill. Sr. H.O. .. 46
Stoke-on-Trent. City Gen. H.O.'s .. 46
Stoke-on-Trent. North Staffs Royal Infy. H.O. 46
Swindon & Dist H.M.C. H.O. .. 46
Tunstall. Burslem, Haywood & Tunstall War Mem. Sr. H.O. 47
Warrington Gen. H.O. 47
Watford & Dist. Peace Mem. H.O. .. 47
Welsh R.H.B. Regs. 47
Weston-super-Mare Gen. H.O. .. 47
Winchester. Royal Hants County. H.O. 47
Wolverhampton H.M.C. H.O. .. 48
Worcester Royal Infy. Sr. H.O. .. 48
Worthing Group H.M.C. Sr. H.O. & H.O. 47
Wrexham. Maelor Gen. H.O. .. 48
Yorkshire. East Riding H.M.C. H.O. 48
Channel Islands, Jersey. Gen. R.S.O. 48

GENERAL

Slough. Upton. Hon. Clin. Asst. .. 46
New York. New Rochelle. Internes. 48
New York. Vassar Brothers. Internships 48
St. John's, Newfoundland. Gen. Internes 48

PUBLIC APPOINTMENTS 48

MISCELLANEOUS 50

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

DAVID LONG, Esq., M.D., will deliver the MILROY LECTURES on TUESDAY, 9TH FEBRUARY, and THURSDAY, 11TH FEBRUARY, 1954, at 5 P.M. at the College, Pall Mall East, S.W.1.

Subject: "The Pathogenesis of Rheumatic Fever."

Any member of the medical profession admitted on presentation of card.

By order of the President.
HAROLD BOLDERO, Registrar.

UNIVERSITY OF LONDON

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
(Incorporating the teaching facilities of Queen Charlotte's Maternity Hospital, Chelsea Hospital for Women, and the Department of Obstetrics and Gynæcology at Hammersmith Hospital)

Applications are invited from graduates with a registrable qualification, for enrolment for the SPRING TERM (8TH MARCH–5TH JUNE, 1954). Graduates attend each of the constituent hospitals in turn for clinical work and attend lectures and special demonstrations at all 3 hospitals. Enrolment fee £3. Tuition fee £30 for 1 term, £55 for 2 terms.

General practitioners wishing further experience in obstetrics may be accepted to attend the course at Queen Charlotte's Maternity Hospital for shorter periods—i.e., 2–4 weeks. They will be allowed to do normal deliveries and will have the opportunity of attending the combined classes of lectures and demonstrations at the 3 hospitals of the Institute. Ministry of Health grants are payable to approved general practitioners attending for a period of 2 weeks.

During the winter vacation, graduates may attend the practice of the hospital at Hammersmith Hospital. Fee £1 per week.

A refresher course for General Practitioners will be held from 1st March to 6th March, 1954.

Hostel accommodation is available at Queen Charlotte's Hospital and at Hammersmith Hospital.

Further particulars can be obtained from the Secretary, Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, S.W.3.

UNIVERSITY OF LONDON

A COURSE of 3 LECTURES on "The Metabolism of Sulphur Amino Acids and the Cycle of Sulphur in Nature" will be given by Prof. C. FROMAGEOT (Paris) at 5.30 P.M., on 8TH, 11TH, and 15TH FEBRUARY, at University College (Physiology Theatre), Gower-street, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF LONDON

A COURSE OF 2 LECTURES on "Discoveries in Pharmacology" will be given by Prof. J. H. GADDUM (Edinburgh) at 5.30 P.M. on 4TH and 5TH FEBRUARY at the School of Pharmacy, 17, Bloomsbury-square, W.C.1.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

UNIVERSITY OF MANCHESTER

FACULTY OF MEDICINE

CERTIFICATE AND DIPLOMA IN PUBLIC HEALTH

The next course covering 2 academic years will begin in OCTOBER, 1954. Candidates are required to obtain posts in the Manchester region from which they are permitted to attend the University for the equivalent of 2½ days each week of 6 academic terms. Every assistance is given to prospective candidates to obtain suitable employment.

Further particulars and application forms may be obtained from the Dean, Postgraduate Medical Studies, The University, Manchester, 13.

UNIVERSITY OF GLASGOW

POST-GRADUATE MEDICAL EDUCATION COMMITTEE

COURSE IN DERMATOLOGY

A Course in Dermatology organised primarily for specialist trainees in Dermatology or in General Medicine, but open also to General Practitioners will be held from 21ST APRIL to 28TH JUNE, 1954.

The Course will consist of 30 Lecture-Demonstrations (syllabus on request), given thrice weekly on MONDAYS, WEDNESDAYS, and FRIDAYS at 4.15 P.M. in the Anderson College Building, The University, Glasgow. In addition, those taking the Course may attend 2 Clinical Demonstrations per week in 1 of various Teaching Hospitals at hours arranged, so far as possible, to suit applicants.

The fee for the complete Course, including the optional Clinical Demonstrations, is 10 guineas. Arrangements are available whereby National Health Service practitioners attending part or all of the Course may recover the fee and travelling expenses from Government sources.

Early application should be made to the Director of Post-Graduate Medical Education, The University, Glasgow, W.2, from whom further information may be obtained.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

Keppel-street, W.C.1

DEPARTMENT OF MEDICAL STATISTICS AND EPIDEMIOLOGY

A COURSE IN STATISTICAL METHODS and their application in medicine will be held in MARCH to JUNE, 1954 (on the mornings of WEDNESDAYS and FRIDAYS from 10th March to 25th June inclusive). Students without a medical qualification can be accepted.

Applications for admission must be made before 1st March. Details of the syllabus of this course can be obtained on request, from the Assistant Dean. Fee for the Course 10 guineas.

THE UNIVERSITY OF LEEDS

Applications are invited for IMPERIAL CHEMICAL INDUSTRIES LIMITED RESEARCH FELLOWSHIPS in Bacteriology, Biochemistry, Biomolecular Structure, Botany (Plant Biochemistry and Biophysics), Chemical Engineering, Chemistry, Chemistry of Leather Manufacture, Chemotherapy, Colour Chemistry and Dyeing, Engineering (Civil, Electrical, or Mechanical), Fuel and Refractories, Geology (including Geochemistry), Metallurgy, Mining (Selective Flotation and Geophysical Surveying), Pharmacology, Physics, Physiology, or Textile Industries (Protein Chemistry and Wool Textile Engineering). The Fellowships will be of an annual value within the range £600–£900 a year according to qualifications and experience, and will normally be tenable for 3 years. Further particulars can be obtained on request.

Applications (3 copies—1 in the case of applicants from overseas), together with the names of 2 referees, should reach the Registrar, The University, Leeds, 2, not later than 21st April, 1954.

THE INSTITUTE OF LARYNGOLOGY AND OTOLOGY

(UNIVERSITY OF LONDON)
330/332, Gray's Inn-road, London, W.C.1

ADVANCED REVISION COURSE for Final F.R.C.S. students from 8TH FEBRUARY to 23RD APRIL, 1954. Arranged as part-time course (mostly evenings) to meet circumstances of students holding appointments. Fee £21.

INTENSIVE COURSE IN ENDOSCOPY for senior students and practising members of the specialty. Whole-time from 26TH APRIL to 1ST MAY, 1954. Includes practical work. Fee £10 10s.

INTENSIVE CLINICAL LECTURE COURSE from 1ST to 26TH FEBRUARY, 1954. Whole-time course intended to form a theoretical basis in preparation for practical clinical training. Fee £12 12s.

BASIC SCIENCES CLASS (with facilities for dissection) for Part I D.L.O. students from 22ND FEBRUARY to 28TH MAY, 1954. Fee £21.

Detailed syllabus obtainable from the Dean.

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

South Kensington, London, S.W.7
PHYSICS DEPARTMENT
(Technical Optics Section)

A COURSE OF 8 LECTURES by B. K. JOHNSON, D.I.C., on "Microscopy" will be given on TUESDAYS and THURSDAYS at 4 P.M., commencing on TUESDAY, 16TH FEBRUARY, 1954.

The Lectures, which will be accompanied by practical demonstrations, will include modern advanced methods in microscopy. They will be suitable for those having to use the microscope in technical practice.

Application for admission should be made to the Registrar of the Imperial College, Prince Consort-road, S.W.7. The fee is £2 2s. for the lectures. Students of the College and Inter-Collegiate students will be admitted free (on production of an Inter-Collegiate ticket).

THE NUFFIELD FOUNDATION

MEDICAL FELLOWSHIPS

As part of its programme for the advancement of health, the Nuffield Foundation is prepared to award a number of Fellowships to highly qualified men and women of the United Kingdom, usually between the ages of 25 and 35, who wish to train further for teaching and research appointments in any branch of medicine.

Applications for awards in 1954 must be received not later than 1ST MAY, 1954.

The conditions of these Fellowships and the application forms are obtainable from the Director, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1.

L. FARRER-BROWN, Director of the Nuffield Foundation.

INSTITUTE OF CARDIOLOGY. (Associated with the National Heart Hospital, Westmoreland-street, London, W.1.) Applications are invited for the full-time post of ASSISTANT DIRECTOR, salary scale corresponding to that of Reader (£1500–£100–£2000) with family allowances and superannuation under the F.S.S.U. Duties will consist of research, teaching and care of beds and an outpatient clinic. The appointment will be for 3 years in the first instance, subject to annual confirmation, and may thereafter be renewed by annual reappointment.

Further information may be obtained from the Dean at 35, Wimpole-street, W.1, to whom applications, together with the names of 3 referees, should be sent not later than 12th March, 1954.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN PHYSIOLOGY tenable at the Royal Free Hospital of Medicine (salary within the range £1200–£1800 a year).

Applications (10 copies) must be received not later than 25th February, 1954, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

NUFFIELD ORTHOPÆDIC CENTRE, Headington, OXFORD. The Trustees invite applications from suitably qualified persons for the following scholarships:—

THE LORD NUFFIELD SCHOLARSHIP IN ORTHOPÆDIC SURGERY. Value £500 p.a. tax free, plus £160 p.a. living-out allowance and the possibility of a terminal grant for the study of orthopædics elsewhere.

GIRDLESTONE MEMORIAL SCHOLARSHIP. Value £330 p.a. tax free, plus a living-out allowance of £160.

Applications, giving full personal details together with the names of 2 referees, to be addressed to the undersigned from whom full particulars can be obtained.

JOHN MULLINS, Secretary to the Trustees.
Wingfield-Morris Orthopædic Hospital.

MIDDLESEX HOSPITAL, W.1. Applications invited for the post of FIRST ASSISTANT to the Professorial Medical Unit. Commencing salary within the range of £1350–£1500 according to experience and qualifications.

Applications, stating age, qualifications, &c., and nominating 3 referees, should be sent to the Secretary of the Medical School by 27th February, 1954.

CHARING CROSS HOSPITAL MEDICAL SCHOOL, 62, Chandos-place, London, W.C.2. TEMPORARY ASSISTANT LECTURER IN ANATOMY required to begin duties immediately. Minimum salary £600 p.a.

Further information and form of application may be obtained from the Secretary.

UNIVERSITY OF CAPE TOWN, South Africa. Applications are invited for the CHAIR OF ORTHOPÆDIC SURGERY in the University of Cape Town. The appointment will be made under the terms of the Joint Staff agreement between the University of Cape Town and the Provincial Administration of the Cape of Good Hope. It is a full-time appointment and the occupant of the Chair is not permitted to undertake remunerative private work. The salary is £2500 p.a., plus a temporary cost-of-living allowance (at present £320 p.a. for a married man and £100 p.a. for others). The Professor is Head of the University Department of Orthopædic Surgery and of the Teaching Department of Orthopædic Surgery within the Division of Surgery. He will be in charge of orthopædic beds in Groote Schuur Hospital, in the Lady Michaelis Orthopædic Home and in the Princess Alice Home of Recovery and will be a Consultant to the new Red Cross War Memorial Children's Hospital.

Applications (with copies of testimonials) should state age, experience, qualifications, publications and research interests, and should give the names of 2 referees whom the University may consult. 2 copies of the application and testimonials should reach the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1 (from whom a memorandum giving the general conditions of appointment should be obtained), not later than 1st March, 1954. An additional copy should be sent direct by air-mail to the Registrar, University of Cape Town, Private Bag, Rondebosch, Cape Town, South Africa, by the same date. The University reserves the right to appoint a person other than one of the applicants or to make no appointment.

UNIVERSITY OF CAPE TOWN, South Africa. Applications are invited for a PROFESSOR OF PHYSIOLOGY. The salary is £1700 p.a. There is also a temporary cost-of-living allowance (at present £320 p.a. for a married man and £100 p.a. for others). The standard salary scale recognised for the Provident Fund is £1200–£50–£1400 p.a.

Applications (with copies of testimonials), should state age, experience, qualifications and research work completed or in progress, and give the names of 2 referees whom the University may consult. 2 copies of the application and testimonials should reach the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1 (from whom a memorandum giving the general conditions of appointment should be obtained), not later than 1st March, 1954. An additional copy should be sent direct by air-mail to the Registrar, University of Cape Town, Private Bag, Rondebosch, Cape Town, South Africa, by the same date. The University reserves the right to appoint a person other than one of the applicants or to make no appointment.

UNIVERSITY OF MALAYA, Singapore. Applications are invited for a SENIOR LECTURESHIP or LECTURESHIP IN MEDICINE. Salary on scale £1330–£70–£1610 p.a. (Senior Lecturer) or £854–£42–£1400 p.a. (Lecturer). Status and point of entry determined by qualifications and experience. Allowances: expatriation in range £210–£280 p.a., cost-of-living in range £294–£637 p.a., for medical qualification £210 p.a. (temporary), in lieu of consulting practice £280 p.a. All paid in Malayan currency. Free passages for appointee, wife, and children under 12 years. Part-furnished quarters at rent not exceeding 10% of salary or housing allowance in lieu. Provident Fund Scheme.

Applications (6 copies), naming 3 referees and stating full qualifications and experience, to be received by 1st March, 1954, by Secretary, Inter-University Council for Higher Education in the Colonies, 1, Gordon-square, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF MELBOURNE, Australia. Applications are invited for the position of PROFESSOR OF MEDICINE. The salary will be £A3500 p.a. with superannuation similar to F.S.S.U.

Further particulars and information as to the method of application should be obtained from the Secretary, Association of Universities of the British Commonwealth, 5, Gordon-square, London, W.C.1. The closing date for the receipt of applications, in London and Australia, is 15th April, 1954.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CONSULTANT E.N.T. SURGEON required at Colindale Hospital, The Hyde, N.W.9 (237 Beds), for 1 half-day a week (at present Monday P.M.). Hospital may be visited by direct appointment.

Detailed applications, including date of birth and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 3rd March, 1954.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ASSISTANT RADIOLOGIST required (whole-time) in the Diagnostic Department, Royal Northern Hospital, N.7 (279 Beds) and other hospitals in the Group. Salary scale £1300 (at age 32)–£1750. Hospital may be visited by direct appointment.

Detailed applications, including date of birth and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 4th March, 1954.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for appointment as:—

(1) Part-time CONSULTANT GYNÆCOLOGIST, Whipps Cross Hospital, London, E.11 (4 sessions a week).

(2) Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade), St. Margaret's Hospital, Epping, Essex. Experience in hæmatology required.

(3) Full-time ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer grade), Essex County Hospital, Colchester. Experience in hæmatology desirable.

Separate applications (6 copies), indicating post concerned and detailing private address, date of birth, qualifications and experience, present appointment(s) (including number of sessions) and grade, and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 13th February, 1954.

THE PRIORY, Roehampton, S.W.15. Applications are invited to fill a vacancy for a Whole-time SENIOR ASSISTANT RESIDENT MEDICAL OFFICER, as Psychiatrist in a Metropolitan Licensed House. Duties will include supervision of treatments by modern psychiatric and therapeutic procedures, and also day-by-day supervision of mentally ill patients. The applicant will be required to obtain the D.P.M. if not already held. Opportunities to obtain the diploma will be given. A modern house is available for a married man with a family. Salary will be in accordance with the Whitley scale, subject to emoluments provided. A superannuation scheme is available. The Institution is altogether outside the National Health Service and deals with private patients only, who are received on a voluntary, temporary, or certified status. The applicant should be available to start duties as soon as possible. Applicants may visit the House by appointment with the Resident Licensee.

Apply, stating age, sex and nationality, qualifications and experience, including details of present and recent appointments. Application for an appointment should be made to the Resident Licensee, The Priory, Roehampton, S.W.15, in writing, or by telephone (PROspect 1743).

BIRMINGHAM REGIONAL HOSPITAL BOARD.

Coventry Group of hospitals; Coventry City Council; Warwickshire County Council

Whole-time ASSISTANT CHEST PHYSICIAN (£1300–£1750 p.a.). Duties at clinics in Coventry and North Warwickshire. Appointment will be made jointly by the authorities concerned, 9/11ths being apportioned for clinical work, responsibility of the Board, 1/11th to Coventry City Council, and 1/11th to Warwickshire County Council in respect of tuberculosis prevention and aftercare.

Herefordshire Group of hospitals

Part-time CONSULTANT in Ophthalmology (4 notional half-days weekly). Duties at Victoria Eye Hospital, Hereford (20 Beds), and other group hospitals and clinics.

AMENDED ADVERTISEMENT

South Warwickshire Group of hospitals

Whole-time ASSISTANT CHEST PHYSICIAN (£1300–£1750 p.a.). Duties mainly at Heathcote Hospital and also at hospitals and clinics in the area. Experience in general diseases of the chest required. Higher qualification desirable. Flat available—Heathcote Hospital.

Birmingham Monyhull Hall hospital (approximately 1200 mental deficiency beds)

Whole-time CONSULTANT PSYCHIATRIST AND DEPUTY MEDICAL SUPERINTENDENT. Duties also at ancillary premises and St. Francis Residential Special School (for 350 educationally subnormal and maladjusted children). Wide experience specialty required. House available.

Applications (15 copies), stating name, age, nationality, qualifications, present and previous appointments, and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, before 15th February, 1954.

LIVERPOOL REGIONAL HOSPITAL BOARD. Winwick HOSPITAL. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST with duties at the above Hospital. Applicants should possess the D.P.M. or an equivalent qualification and have had reasonable experience in psychiatry, including practical knowledge of outpatient work. Duties will include attendance at outpatient clinics outside the Hospital. Salary £1300 (at age 32)–£50–£1750.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 20th February, 1954.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. Walton HOSPITAL. Applications are invited for the post of Whole-time ASSISTANT PATHOLOGIST with duties at the above Hospital. Applicants should have general all-round experience in clinical pathology. The possession of a higher qualification will be considered an advantage. The successful candidate will work under the direction of the Consultant Pathologist. Salary £1300 (at age 32)–£50–£1750.

Forms of application from and to be returned to Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 20th February, 1954.

VINCENT COLLINGE, Secretary to the Board.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT SURGEON (8 half-days per week) for the Isle of Wight Group of hospitals. Successful candidate will be required to work 5 half-days per week at St. Mary's Hospital, Newport, and 3 half-days per week at Royal Isle of Wight County Hospital, Ryde, or at any other hospital in the Group as the Board may, from time to time, determine. He will be expected to live in the Newport area.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 27th February, 1954. Applicants may visit hospitals by local arrangement.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT CHEST PHYSICIAN (whole-time), Great Yarmouth and Lowestoft Chest Clinic Area. Main clinic situated in Great Yarmouth. Higher medical qualification and wide experience in tuberculosis and diseases of the chest essential. Salary scale £1300–£1750.

Detailed applications (8 copies), including age, to Secretary of Board, 117, Chesterton-road, Cambridge, by 8th February, 1954. Candidates invited to visit clinics by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital, Norwich.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the part-time post (8 half-days weekly) of CONSULTANT OPHTHALMOLOGIST to the Bolton and District Hospital Centre (special Ophthalmic Unit of 25 Beds at Bolton Royal Infirmary). Initially the successful candidate will be required to devote about 5 hours a week to the Bury General Hospital, but later will devote himself entirely to Bolton. Wide experience and higher qualifications essential.

Application forms from the Senior Administrative Medical Officer to the Board at Cheetwood-road, Manchester, 8, to be returned by 15th February, 1954.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CONSULTANT ANÆSTHETIST required for 3 half-days a week at Upton Hospital, Slough (213 Beds). Hospital may be visited by direct appointment.

Detailed applications, including date of birth and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 28th February, 1954.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST required for 3 half-days a week in the Maternity Units at Luton and Hitchin, centred mainly at Luton Maternity Hospital, Luton (78 Beds), and North Herts Hospital, Hitchin (40 maternity beds). Hospitals may be visited by direct appointment.

Detailed applications, including date of birth and names of 3 referees, to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 4th March, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR HOSPITAL MEDICAL OFFICER in Psychiatry required at Bracebridge Heath Hospital, near Lincoln, for minimum period of 3 months. Remuneration at the rate of 31½ guineas per week.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT ASSISTANT PHYSICIAN to the Lincoln No. 1 Hospital Management Committee Group. The person appointed will have day-to-day care of 42 infectious diseases beds at the Lincoln Isolation and Chest Hospital, but will be mainly occupied with geriatric duties at the St. George's Hospital, Lincoln (102 Beds). Salary £1300–£50–£1750.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 27th February, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time or maximum Part-time CONSULTANT CHILDREN'S PSYCHIATRIST required for South Lincolnshire, the work being based upon Lincoln, Boston and Grantham.

Application forms and further details obtainable from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 27th February, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT ANÆSTHETIST for the Leicester Royal Infirmary and Leicester General Hospital, with possibly some duties at other hospitals in the Leicester area. Candidates should be in possession of the D.A. Salary scale £1300–£50–£1750 p.a.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Completed forms to be returned by 20th February, 1954.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SENIOR CASUALTY OFFICER at the Scunthorpe and District War Memorial Hospital. Salary within the range of £1300–£50–£1750. Tenure for a period not exceeding 4 years.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 20th February, 1954.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments :—

ASSISTANT SURGEON (Consultant grading), to Falkirk Royal Infirmary and hospitals under the control of the Board of Management for Falkirk and District Hospitals. The terms of the appointment are whole-time or part-time on the basis of 7 sessions weekly.

Whole-time ASSISTANT DENTAL SURGEON for orthodontic duties based at Glasgow Dental Hospital and with Regional duties associated in the first instance with the Counties of Renfrew and Ayr. Salary on the scale £1300–£50–£1750.

Whole-time ASSISTANT OPHTHALMOLOGIST for duties in the hospitals in the area of the Boards of Management for Stirling and Clackmannan Hospitals and Falkirk and District Hospitals. Salary on the scale £1300–£50–£1750.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a CONSULTANT ANÆSTHETIST to serve the Rhymney and Sirhowy Valleys Hospital Management Committee. The successful candidate, who will work mainly at the Caerphilly District Miners' Hospital, will be required to reside within the area, and will also be expected to serve other hospitals in this and neighbouring groups. Candidates must be in possession of the D.A., and have had wide experience in the specialty. The successful candidate will be asked to state whether he wishes to hold a whole-time or maximum part-time appointment.

Applications (12 copies), stating age, giving details of qualifications, experience, previous appointments, with dates, and publications, together with the names of 3 referees, should be addressed to the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 21 days of appearance of this advertisement.

NORTHERN IRELAND HOSPITALS AUTHORITY invite applications for the post as CONSULTANT ANÆSTHETIST to the North Antrim Group of hospitals. The terms and conditions of the appointment will be in accordance with the Authority's application of the Spens Report to Northern Ireland.

Applications should be made on a form which may be obtained (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, Victory Buildings, 44–46, Queen-street, Belfast, and will be received not later than 22nd February, 1954.

Hospital Services : Junior Appointments

BROMPTON HOSPITAL, S.W.3. Applications are invited for the post of NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st April. Duties include work in Outpatient Department and wards. Salary £400 or £450 a year, according to experience.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 6th February, to—

KENNETH A. F. MILES, House Governor.

BROOK GENERAL HOSPITAL, Shooters Hill-road, Woolwich, S.E.18. HOUSE PHYSICIAN (infectious diseases). Appointment for 6 months in first instance. Salary £450 p.a., less £100 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Medical and Cardiological Department. Appointment for 6 months from 22nd March, 1954.

Applications, with copy each of 2 testimonials, to Medical Director by 6th February, 1954.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required for Tuberculosis Unit (58 Beds) run in conjunction with Willesden Chest Clinic. Good experience, modern methods, weekly surgical list, close liaison with medical wards of Hospital. Appointment for 6 months from 1st March, 1954.

Applications, with copy each of 2 testimonials, to Medical Director by 6th February, 1954.

CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE.

(1) Dulwich Hospital, East Dulwich-grove, London, S.E.22.

(2) St. Giles' Hospital, Camberwell, London, S.E.5.

Applications invited for appointments as HOUSE OFFICERS (duties obstetrics and gynæcology). Salary £350, £400, or £450 a year according to posts held, with deduction at the rate of £100 a year for residence. Recognised pre-registration posts. Vacant from (1) 2nd March, (2) 1st March.

Applications, stating age, qualifications, previous posts (if any) enclosing copy testimonials or names of referees, to the Group Secretary, Dulwich Hospital, East Dulwich-grove, S.E.22.

DULWICH HOSPITAL, East Dulwich-grove, London, S.E.22. CAMBERWELL HOSPITALS MANAGEMENT COMMITTEE. Applications invited for appointment as HOUSE OFFICER (general surgical duties), vacant from 21st February, 1954. Recognised pre-registration post. Salary £350, £400 or £450 a year, according to posts held, less £100 a year for residence.

Applications, stating age, details of qualifications and previous posts if any, enclosing copy testimonials or names of referees, to the Group Secretary, Dulwich Hospital, S.E.22.

EASTERN HOSPITAL (Fevers), Homerton-grove, London, E.9. Applications for the post of SENIOR HOUSE OFFICER (deduction £130 p.a. for residence) should be sent to Group Secretary, Hackney Hospital, London, E.9, with copies of 3 testimonials. The post is for 1 year in the first instance; duties of successful candidate may include some work in the Chest Unit.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE SURGEON to Gynæcological Department (recognised for M.R.C.O.G.). Duties to commence 1st April, 1954. Appointment for 6 months. Salary in accordance with Ministry of Health scale for House Officers.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 10th February, 1954.

GUY'S-MAUDSLEY NEUROSURGICAL UNIT. Applications are invited for the post of SENIOR HOUSE OFFICER for 6 months commencing 1st March, 1954. The unit, which is housed in the Maudsley Hospital, serves both Guy's Hospital and the Bethlem Royal Hospital.

Applications, giving details of experience and the names of 3 referees, should be made to—

K. J. JOHNSON, House Governor and Secretary.
Maudsley Hospital, Denmark-hill, London, S.E.5.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. SENIOR HOUSE OFFICER (Department of Medicine) required as soon as possible.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 8th February.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. HOUSE SURGEON (radiotherapy) required 1st April.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 13th February.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. HOUSE SURGEON (orthopædics) required as soon as possible.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, immediately.

HOSPITAL FOR WOMEN, Soho-square, W.1 (affiliated to the Middlesex Hospital). Applications are invited for a full-time post of RESIDENT SENIOR GYNÆCOLOGICAL HOUSE OFFICER, vacant on 1st April, 1954. Appointment is for 6 months but the holder can apply for an extension of 6 months. Salary in accordance with the terms laid down for medical and dental staffs, less a deduction of £100 p.a. for residential emoluments. The appointment is recognised for the M.R.C.O.G. examination.

Applications, stating age, nationality, qualifications, and experience, supported by the names and addresses of 3 referees, must reach the undersigned not later than Saturday, 13th February. D. C. EMERY, Secretary.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcology Departments and to be responsible for the Casualty Department, as a third post at a salary at the rate of £450 p.a., to become vacant on Monday, 8th February, 1954. Appointment will be for a period of 6 months.

Applications should reach the Secretary on or before Tuesday, 2nd February, together with copies of 3 recent testimonials.

HACKNEY HOSPITAL, London, E.9. (General—807 Beds.) Applications are invited for the appointment of OBSTETRIC HOUSE SURGEONS (1 pre-registration second post, 1 third post) for 6 months as from 17th February and 1st April respectively. Posts recognised for M.R.C.O.G.

Apply Group Secretary, Hackney Hospital Management Committee, E.9, by 5th February.

HACKNEY HOSPITAL, London, E.9. (General—807 Beds.) Applications for the 6 months appointment of CASUALTY OFFICER AND E.N.T. HOUSE SURGEON (House Officer grade), vacant in February, should reach the Group Secretary, Hackney Hospital, E.9, as soon as possible, quoting reference HH/CO.

KING'S COLLEGE HOSPITAL, Denmark-hill, S.E.5. Applications are invited for the post of REGISTRAR in General Surgery. The appointment, which is subject to the terms and conditions of service for medical and dental staffs, will be for 1 year in the first instance, from 1st February, 1954.

Applications, stating age, education, qualifications and experience, with the names of 2 referees, should be sent to the undersigned by 15th February, 1954.

S. W. BARNES, House Governor.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st April, 1954, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London 2 at the Country Branch, near Letchworth, and posts are graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 12th February.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

METROPOLITAN HOSPITAL, Kingsland-road, London, E.8. (General—147 Beds.) CENTRAL GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (casualty). Salary £670 p.a., less £130 p.a. residential charges.

Applications, stating age, nationality, qualifications and experience, together with 3 testimonials, to be sent to the Hospital Secretary immediately.

MOTHERS' HOSPITAL (Salvation Army), Clapton, E.5. (Maternity—110 Beds.) Applications are invited from registered medical practitioners for the following House Officer posts :—

(*a*) RESIDENT OBSTETRIC HOUSE SURGEON (2 vacancies from 1st March).

(*b*) RESIDENT OBSTETRIC HOUSE SURGEON (vacant 1st May).

The posts are recognised for the M.R.C.O.G. and candidates should have held resident medical or surgical posts.

Apply, Group Secretary Hackney Hospital Management Committee, stating for which appointment application is made.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (whole-time) to the Lysholm X-ray Department at The National Hospital, Queen-square, to commence approximately 1st April, 1954. This post usually carries the grade of Senior Registrar. Applicants should hold a Diploma in Diagnostic Radiology and have had experience in general radiology. The appointment will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 20th February, 1954.

H. EWART MITCHELL, Secretary.

The National Hospital, Queen-square, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN at The National Hospital, Queen-square, W.C.1. This post carries the grade of Registrar. The appointment will be for 1 year and will be renewed in exceptional circumstances.

Applications with names of 3 referees to be sent to the undersigned not later than 13th February, 1954.

H. EWART MITCHELL, Secretary.

The National Hospital, Queen-square, W.C.1.

NEW END HOSPITAL, Hampstead, N.W.3. North West METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (general surgery) required at above Hospital. Unit consists of 93 Beds with large Thyroid Department. F.R.C.S. desirable. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary. 46, Cholmeley-park, N.6, by 8th February, 1954.

NEW END HOSPITAL, Hampstead, N.W.3. Applica-tions are invited for the post of HOUSE PHYSICIAN (general medicine) vacant 1st March, 1954. Preference will be given to candidates seeking pre-registration posts under the Medical Act, 1950.

Detailed applications, together with copies of 2 recent testimonials and name of 1 referee, to Surgeon-Superintendent, New End Hospital, N.W.3, by 8th February, 1954.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of CASUALTY OFFICER. Post-registration appointment, House Officer grade, tenable for 6 months, as from 1st April, 1954.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than 6th February, 1954.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (219 Beds.) TOTTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE (GROUP 4). The Green, N.15. Applications are invited from registered medical practitioners for the appointment of RESIDENT HOUSE SURGEON to Orthopædic, Fracture and Traumatic Department, E.N.T. Department, and SENIOR CASUALTY OFFICER (second or third post) for a period of 6 months, now vacant.

Application form from Secretary.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. OBSTETRIC HOUSE SURGEON required (Male or Female) (House Officer third post) for 6 months commencing 27th February, 1954. The successful candidate will be eligible for appointment as Senior Obstetric Officer (Senior House Officer grade) for the following 6 months.

Applications, with copies of recent testimonials, to Group Secretary, West Ham Hospital Management Committee, Stratford, E.15, by 10th February, 1954.

ROYAL EYE HOSPITAL, S.E.1. King's College Hospital GROUP. Applications are invited for 2 posts of RESIDENT SENIOR HOUSE OFFICER starting on 1st April, 1954.

Applications, with copies of recent testimonials, should be made to the Secretary, The Royal Eye Hospital, St. George's circus, S.E.1, by 16th February, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Appli-cations are invited for the post of CASUALTY OFFICER (House Officer grade), post recognised for F.R.C.S.

Applications, stating qualifications and experience, with copies of recent testimonials, to be sent to the Hospital Secretary, by 6th February, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Applications are invited for the post of HOUSE SURGEON, vacant 1st March, 1954. Recognised pre-registration post.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials, to be sent to the Hospital Secretary by 6th February, 1954.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. Appli-cations are invited for the post of SENIOR HOUSE OFFICER (orthopædics), vacant 15th February, 1954. Occasional casualty duties involved. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to be sent to the Hospital Secretary by 6th February, 1954.

ROYAL FREE HOSPITAL, W.C.1. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, W.C.1. The appointment is full-time, resident, for 6 months, duties to commence on 1st April, 1954. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 4th February, 1954.

ROYAL FREE HOSPITAL. Applications are invited for the post of SENIOR REGISTRAR to the E.N.T. Department of the Royal Free Hospital. Duties will commence on 1st April, 1954, and the appointment will be for 1 year in the first instance. Applicants should be registered medical practitioners of not more than 10 years standing, and be Fellows of the Royal College of Surgeons.

Applications, together with the names of 3 referees, should be made to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, London, W.C.1, not later than 22nd February, 1954.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the Ophthalmic Department for a period of 1 year in the first instance to carry out 3 afternoon sessions per week.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 6th February, 1954.

WEST LONDON HOSPITAL, Hammersmith-road, London, W.6. RESIDENT HOUSE OFFICER (anæsthetics) required immediately.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary by 6th February.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. SENIOR HOUSE OFFICER (general surgery), vacant now. 6 months appointment in the first instance. Salary £670 p.a., less £150 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. NICHOLAS HOSPITAL, Tewson-road, Plumstead, S.E.18. HOUSE SURGEON (gynæcology and obstetrics), vacant 1st March, 1954. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G. 6 months appointment in first instance. Salary £450 p.a., less £100 p.a. for residence.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment as RESIDENT SURGICAL OFFICER to fill a vacancy in the approved establishment at the Camberwell Group of hospitals. The salary will be £890 p.a. and the appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance, renewable for a further year.

Applications, giving particulars of age, qualifications, and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 13th February, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time (8 notional half-days) SENIOR REGISTRAR to the Bacteriology and V.D. Pathology Department. The appointment is for a first period of 12 months, as from 1st April, 1954, and is subject to annual review. The successful candidate will be required to devote the remaining 3 notional half-days to work in the Wright-Fleming Institute, for which he will receive a salary so that his total remuneration is equal to that of a whole-time Senior Registrar.

Applications, stating nationality, date of birth, permanent address, qualifications, with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 15th February, 1954.

ST. MARY'S HOSPITAL, W.2. Applications are invited for a Part-time REGISTRAR to the E.N.T. Department for 2 notional half-days per week (Monday and Thursday mornings), with the possibility of an additional 2 notional half-days per week at the Princess Louise (Kensington) Hospital for Children after 9th June, 1954. The successful candidate will be required to take up his duties at St. Mary's Hospital as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications, with dates and details of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 10th February, 1954.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 RESIDENT HOUSE SURGEONS (Male) required at above Hospital for general surgical duties. 6 months appointments, 1 vacant on 1st March and the other on 8th March. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital by 6th February, 1954.

ASHFORD HOSPITAL, Ashford, Middlesex. North West METROPOLITAN REGIONAL HOSPITAL BOARD. RESIDENT REGISTRAR (Male) required at above Hospital, for Tuberculosis Unit of 56 Beds with some outpatient work. Post vacant 1st March or early thereafter. Hospital may be visited by direct appointment with the Medical Director.

Application forms obtainable from, and returnable to, the Secretary, Staines Group Hospital Management Committee, Ashford Hospital, Ashford, Middlesex, by 13th February, 1954.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE, AYLESBURY, BUCKS. Applications are invited for the following appointments :—

Royal Buckinghamshire Hospital

HOUSE SURGEON to the Department of Ophthalmology which is centred on this Hospital and which conducts work at peripheral clinics. Vacant now. Post is recognised for D.O. and duties will include some children's surgery.

Applications, with 2 testimonials, to Secretary-Superintendent as soon as possible.

Stoke Mandeville Hospital

SENIOR HOUSE OFFICER in Department of Neurology of the United Oxford Hospitals for duties at Stoke Mandeville Hospital.

JUNIOR HOSPITAL MEDICAL OFFICER for National Spinal Injuries Centre. Neurological or surgical experience desirable.

Applications, with copies of 2 recent testimonials, to the Administrative Officer, Stoke Mandeville Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the following appointments at Ashton-under-Lyne General Hospital (800 Beds) :—

SENIOR HOUSE OFFICER (general surgery), vacant now.

HOUSE SURGEON, vacant now. Recognised for F.R.C.S.(Eng.). Pre-registration post.

HOUSE OFFICER (pædiatrics), vacant now. Recognised for the D.C.H.

Applications, stating age, nationality, qualifications and experience together with copies of 3 testimonials, should be forwarded to the Group Secretary, Astley-road, Stalybridge, Cheshire.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.) HOUSE SURGEON (not pre-registration). Post vacant immediately.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital is recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident post of SENIOR HOUSE OFFICER at the above Hospital.

Full particulars, stating age, qualifications and experience, should be addressed to—

J. PRICE THOMAS, Secretary,
Mid-Wales Hospital Management Committee.
General Hospital, Aberystwyth.

ABERYSTWYTH. GENERAL HOSPITAL. (Hospital recognised for F.R.C.S. examination.) MID-WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from newly qualified medical practitioners seeking pre-registration posts under the Medical Act, 1950, for the resident post of HOUSE SURGEON at the above Hospital. Busy General Hospital. Salary on national scale less deduction for board and lodging.

Applications, with 2 testimonials, to the Group Secretary, Mid-Wales Hospital Management Committee, General Hospital, Aberystwyth, immediately.

ASHINGTON HOSPITAL. (55 Beds.) Wansbeck Hos-PITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER. The post is now vacant. The work is predominantly surgical, but 10 beds are allocated to a Consulting Physician.

Applications, stating age, qualifications, details of present and previous employments, together with the names of 2 referees, should be sent as early as possible to the Secretary, Wansbeck Hospital Management Committee, Thomas Knight Memorial Hospital, Blyth, Northumberland.

BARNSLEY. BECKETT HOSPITAL. (182 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

BEXHILL HOSPITAL, Bexhill, Sussex. (62 Beds.) 2 HOUSE SURGEONS. Posts now vacant. A small modern hospital on the South Coast, considerable acute surgical work and busy Outpatient Department, excellent all-round experience. National scale of salary.

Apply to Hospital Administrator.

BIRMINGHAM ACCIDENT HOSPITAL AND REHABILI-TATION CENTRE, Bath-row, BIRMINGHAM, 15. (215 Beds.) HOUSE SURGEONS (Male or Female). 2 posts vacant in February, 1 post vacant in March. Recognised for F.R.C.S. The appointments will be for a period of 6 months, of which 2 may be spent in the Burns Unit (Medical Research Council). The Hospital is the largest Traumatic Unit in the country, and treats 50,000 new patients each year. Posts are open to registered practitioners and offer ample opportunity for practical experience in the management of all types of injury and teaching by the Consultant staff.

Applications, with copies of recent testimonials or names of 2 referees, to the Administrator.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Dudley Road) Group of Hospitals, Dudley-road, Birmingham, 18**

OPHTHALMOLOGIST (Registrar) required in Research Department of Birmingham and Midland Eye Hospital, Church-street, Birmingham, 3, to assist in experimental physiology and clinical research ; opportunity to work for higher degree.

(2) **Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry**

Whole-time REGISTRAR in Infectious Diseases at Whitley Hospital, Coventry (143 Beds). Duties mainly in connection with 90 infectious diseases beds and other units concerned with skin diseases and pulmonary tuberculosis. Furnished flat available, suitable for doctor and wife.

(3) **Mid-Worcestershire Hospital Management Committee, Birmingham-road, Bromsgrove**

Whole-time REGISTRAR in Obstetrics and Gynæcology. Duties in Mid-Worcestershire Group at All Saints' Hospital, Bromsgrove (423 Beds) (7 notional half-days weekly), and Dudley and Stourbridge Group (4 notional half-days).

(4) **South Warwickshire Hospital Group, 87, Radford-road, Leamington Spa**

REGISTRAR in Pædiatrics. Duties at Warwick Hospital (includes main Pædiatric Centre), Stratford Children's Hospital, and other hospitals in Leamington and Stratford-on-Avon area. Non-resident. Experience in specialty desirable.

(5) **Stafford Hospital Management Committee, 13, Foregate-street, Stafford**

Whole-time REGISTRAR in Surgery. Resident. Duties mainly at the Staffordshire General Infirmary (175 Beds) and Yarnfield Recovery Unit (32 Beds). Experience in surgery essential. Higher qualification desirable. Hospital recognised for F.R.C.S.

Application forms from Group Secretaries, to be returned before 15th February, 1954. Candidates may visit hospitals concerned.

BIRMINGHAM (MENTAL A) GROUP NO. 5 HOS-PITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (Male or Female), resident. Salary £670 p.a. (less £120 p.a. charge for services). The post, which will be for 1 year in the first instance, will be subject to the terms and conditions of service for medical and dental staffs and subject to the National Health Service superannuation regulations. The Hospital is associated with the University of Birmingham for the teaching of psychiatry, and training for the Diploma in Psychological Medicine will be provided.

Applications, stating age and qualifications, to be sent to the Medical Superintendent at the Hospital.

BIRMINGHAM, 9. LITTLE BROMWICH HOSPITAL. Applications are invited from registered medical practitioners for the appointment of PÆDIATRIC HOUSE PHYSICIAN (Male or Female). Post vacant 1st March, 1954. This post, which is recognised for the D.C.H., includes work in the pædiatric and infectious diseases wards and Outpatient Department, and arrangements are made to attend a Neonatal Department and the necessary clinics. Salary £350–£450 p.a. according to experience.

Applications, stating age, qualifications, and experience, with copies of 2 testimonials, to the Physician-Superintendent.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (1009 Beds.) Applications invited for the post of CASUALTY OFFICER (Senior House Officer), resident or non-resident. Recognised for F.R.C.S.

Applications, giving qualifications, experience and age, with copies of 3 recent testimonials, to the Medical Superintendent.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. QUEEN ELIZABETH HOSPITAL. HOUSE SURGEON to E.N.T. Department required for period ending 6th July, 1954. Recognised for pre-registration students but registered medical practitioners may apply.

Forms of application may be obtained from the undersigned.

G. A. PHALP,
Secretary and Principal Administrative Officer,
United Birmingham Hospitals.

Queen Elizabeth Hospital, Birmingham, 15.

BIRMINGHAM. ROYAL ORTHOPÆDIC HOSPITAL. Long and short term orthopædic cases (non-traumatic). 338 Beds and extensive Outpatient Services. SENIOR HOUSE OFFICER.

Applications from registered medical practitioners, preferably with previous orthopædic experience, with copies of testimonials, to the Administrator, 80, Broad-street, Birmingham, 15.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL.

RESIDENT SURGICAL OFFICER (Senior House Officer). Good experience in general surgery and 5 other Resident Medical staff.

OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (Senior House Officer grade); post vacant middle February. Some experience in obstetrics or gynæcology desirable but not essential. Post recognised for the Diploma examination.

Applications, stating age, nationality, qualifications and experience, together with copies of testimonials or names of referees, to the Medical Superintendent.

BEDFORD GENERAL HOSPITAL. (433 Beds.) Locum RESIDENT SENIOR HOUSE OFFICER (gynæcology and obstetrics) required from 21st February to 8th March, 1954 (inclusive). Salary £13 per week.

Applications, stating age, nationality, qualifications, previous appointments, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by not later than 10th February, 1954.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for the following 3 HOUSE SURGEON posts :—

Blackburn Royal Infirmary (262 acute beds).
Accrington Victoria Hospital (112 acute beds).
Queen's Park Hospital, Blackburn (644 general, including 234 acute beds).

Approved for pre-registration purposes. Recognised for F.R.C.S.

Apply to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics) required. Residence, and duties mainly, at Queen's Park Hospital, Blackburn, with sessions at the Blackburn Royal Infirmary and Accrington Victoria Hospital as arranged by the Consultant Anæsthetist. Post recognised for D.A. and F.F.A.R.C.S.

Apply to the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN ROYAL INFIRMARY. Senior House OFFICER (orthopædics and casualty) required to take up duty February, 1954. This post is recognised for F.R.C.S. and offers wide experience in this specialty in the Outpatient and Casualty Departments and wards of a busy 262-Bedded acute hospital.

Apply to the Secretary, Blackburn and District Hospital Management Committee, Royal Infirmary, Blackburn.

BLACKPOOL. VICTORIA HOSPITAL. (344 Beds.)

(1) SENIOR HOUSE OFFICER (anæsthetics). 2 posts. Recognised for D.A. and F.F.A. R.C.S. Vacant 1st April, 1954. Resident.

(2)(*a*) SENIOR HOUSE OFFICER (Orthopædic and Casualty Departments). Resident.

(*b*) HOUSE OFFICER (casualty and orthopædics). Resident.

Both posts recognised for 6 months casualty training for F.R.C.S.

(3) HOUSE OFFICERS (2 posts) Surgical Department, vacant 15th February, 1954. Recognised for F.R.C.S. Resident.

The Hospital (opened 1937) has a very busy Outpatient Department and the posts offer good experience in departments under the control of Consultants.

Applications, with references or names of referees, should be sent to the Group Secretary, Victoria Hospital, Blackpool.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT OBSTETRIC OFFICER, vacant 4th March. The appointment is recognised for the F.R.C.S. examination and for the Diploma in Obstetrics. Salary £350–£450 p.a.

Applications to the Deputy Hospital Secretary, Royal Victoria Hospital, Shelley-road, Bournemouth.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the immediate appointment of RESIDENT SENIOR HOUSE OFFICER (orthopædic and casualty combined). The post is recognised for the F.R.C.S. examination and is tenable for 1 year.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (492 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON for General and Thoracic Surgery, vacant now. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE, SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery for the above Hospital Group consisting of 18 hospitals with 1548 Beds. The orthopædic work is conducted mainly at the 2 major hospitals of the Group, viz., Royal Victoria Hospital, Bournemouth, and Poole General Hospital, with 100 orthopædic beds and large Outpatient Departments covering both traumatic and non-traumatic orthopædics in all branches in children and adults.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Bournemouth, should be returned to him, duly completed, within 14 days of the appearance of this advertisement.

BOURNEMOUTH. CHRISTCHURCH HOSPITAL CHRISTCHURCH, HANTS. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of MEDICAL REGISTRAR at the above Hospital of 290 Beds (including 60 acute medical, chest and chronic sick beds). Applicants must be registered medical practitioners, and the possession of a higher qualification will be considered an advantage. The post becomes vacant on 28th February, 1954, and is tenable for 1 year in the first instance. Duties will include outpatient work at the Royal Victoria Hospital, Bournemouth.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, Bournemouth, should be returned to him, duly completed within 14 days of the appearance of this advertisement.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical, and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for a RESIDENT HOUSE OFFICER (first or second post held). Salary £350–£400 p.a., less £100 p.a. residential emoluments. Appointment to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BISHOP'S STORTFORD, HERTS. HAYMEADS HOSPITAL. (400 Beds. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical) for duties mainly in the Tuberculosis Unit of 43 male and 23 female beds. Salary £670 p.a., less £130 p.a. in respect of residential emoluments provided. Appointments to commence as soon as possible.

Applications, stating age, nationality, qualifications, and experience, with copies of recent testimonials or the names of referees, to the Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HAYMEADS HOSPITAL. (Midway between London and Cambridge. Main Line from Liverpool Street.) Applications are invited for the following appointments :—

SENIOR HOUSE OFFICER (pathology) to commence 1st April, 1954, for 1 year. Salary £670, less £130 p.a. in respect of resident emoluments.

HOUSE OFFICER (medicine), Male or Female, pre-registration or first or second post, to commence 7th April, 1954, for 6 months. Salary £350–£400, less £100 p.a. in respect of resident emoluments.

Applications, stating qualifications, nationality, age and experience, with copies of recent testimonials or the names of 2 referees, should be sent to the Hospital Secretary.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) Applications are invited for :—

(*a*) HOUSE SURGEON (General Surgical Unit).
(*b*) HOUSE SURGEON (General Surgical and Gynæcological Unit).

Designated for Pre-registration Service. The Hospital is recognised for the F.R.C.S.

Applications with full details, naming 2 referees, should be sent to the Secretary.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) Locum CASUALTY OFFICER required immediately. Remuneration at the rate of £16 per week, with a deduction for residence.

Apply Secretary.

BURTON-ON-TRENT GENERAL INFIRMARY. (240 acute beds.) JUNIOR HOSPITAL MEDICAL OFFICER required for Casualty and Orthopædic Departments. Recognised for F.R.C.S.

Applications, with full details, naming 2 referees, to Secretary.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medical), Rossendale General Hospital (resident or non-resident).

Applications, giving names of 2 referees, should be made to—

H. WILKINSON, Esq., Group Secretary.
Bury General Hospital, Bury, Lancs.

BURY ST. EDMUNDS. WEST SUFFOLK GENERAL HOSPITAL. (289 Beds.) SENIOR HOUSE OFFICER for casualty and orthopædic duties required. Post recognised for F.R.C.S.

Inquiries and applications to Hospital Secretary.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. SENIOR HOUSE OFFICER for Surgical Tuberculosis Department at above Hospital. Recognised for F.R.C.S. Duties mainly concerned with genito-urinary tuberculosis, including 1 day a week at the London Hospital Genito-Urinary Department.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of HOUSE OFFICER (orthopædic surgery). (First, second, or third post.) Post tenable for 6 months and is recognised under F.R.C.S. regulations. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRADFORD CHILDREN'S HOSPITAL. (102 Beds.) HOUSE OFFICER (Female), vacant now. Salary £350–£450 p.a. less £100 p.a. residential emoluments. Recognised for D.C.H.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD ROYAL INFIRMARY. House Surgeon (general and urology), vacant 1st March. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary.

BRADFORD ROYAL INFIRMARY.

SENIOR HOUSE SURGEON (Thoracic Unit), vacant now.

SENIOR ORTHOPÆDIC HOUSE SURGEON/CASUALTY OFFICER, vacant 1st February.

Salary for either of above posts £670 p.a., less £130 p.a. residential emoluments.

ORTHOPÆDIC HOUSE SURGEON CASUALTY OFFICER, vacant 1st February. Recognised for pre-registration purposes. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications for all above posts, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary.

BRADFORD. ST. LUKE'S HOSPITAL. House Officer (anæsthetics), vacant now. Recognised for D.A. and F.F.A. R.C.S. Opportunities for plastic and intrathoracic experience. Salary £350–£450 p.a., less £100 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Bradford Royal Infirmary.

BROMSGROVE. REGIONAL THORACIC SURGICAL CENTRE: HILL TOP HOSPITAL, MID-WORCESTERSHIRE HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER. Post vacant 1st March, 1954. All aspects of thoracic surgery dealt with, including cardiac, pulmonary, alimentary and children's diseases.

Applications, with the names of 3 referees, to the Group Secretary, Mid-Worcestershire Hospital Management Committee, Birmingham-road, Bromsgrove.

BRENTWOOD, ESSEX. WARLEY HOSPITAL. Junior HOSPITAL MEDICAL OFFICER required. The Hospital is situated within easy reach of London by main line electric service and bus. There are over 2000 Beds and a wide experience of all types of mental disorders (including the neuroses) can be obtained. All modern treatments are carried out, including psychosurgery. Visiting Consultants in other specialties attend regularly. Teaching by senior staff and facilities for attending postgraduate courses are provided; also experience of outpatient clinics. Regular clinical meetings are held. Library, indoor and outdoor recreational facilities. The post is resident and a modern house is available at a reasonable rent. Salary £700 p.a.–£50–£1000 p.a.

Applications, stating age, experience and qualifications, should be sent to the Physician-Superintendent, with the names of 2 referees.

BRIDGEND GENERAL HOSPITAL, Quarella-road, BRIDGEND. (364 Beds.) MID-GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (orthopædic and traumatic). Appointment available 1st February, 1954, and tenable for 6 months. This Hospital is recognised for the F.R.C.S., D.C.H., M.R.C.O.G., and F.F.A.R.C.S. examinations.

Applications, naming 2 referees, to be addressed to the Group Secretary of the Committee, 8, Wind-street, Neath.

CARMARTHEN. WEST WALES GENERAL HOS-PITAL. (160 Beds. Recognised for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (medical) which will become vacant on 7th March, 1954. Salary £350, £400, and £450 p.a., according to experience (plus special grant of £50 p.a.), less £100 p.a. for board-residence.

Applications, stating age, qualifications, experience and nationality with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CAMBRIDGE. FULBOURN HOSPITAL. Senior House OFFICER (resident or non-resident). Previous psychiatric experience not required. This Hospital of 960 Beds is linked with the Cambridge University Department of Psychology and Addenbrooke's Hospital, and provides a basic psychiatric training leading to the D.P.M.

Applications, stating age, qualifications and experience, with names of 2 referees, should be sent to—

Dr. D. H. CLARK, Medical Superintendent.

Fulbourn Hospital, near Cambridge.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Gyna-COLOGICAL HOUSE SURGEON for 6 months from 1st April, 1954. Second or subsequent post. Recognised Pre-registration Service. Recognised for M.R.C.O.G.

Apply, stating age, nationality, qualifications and experience, with dates, and copies of 3 testimonials, to Secretary by 13th February. Interviews 5th March.

CAMBRIDGE. ADDENBROOKE'S HOSPITAL. Casualty OFFICER (Senior House Officer grade), for 1 year from 16th March, 1954. Duties from 9 A.M. to 6 P.M. daily with 1 half-day a week and alternate weekends off duty. Non-resident if desired, but resident night duties once a week.

Apply, with full particulars and copies of 3 recent testimonials, to the Secretary, by 6th February. Interviews mid-February.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) Recognised pre-registration appointment. CHELTENHAM GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE SURGEON. Salary at the rate of £350, £400, or £450 p.a., less £100 residential emoluments.

Applications, stating age, qualifications, experience, and enclosing copy testimonials, should be sent to the Secretary, Group Management Committee, General Hospital, Cheltenham.

CHELTENHAM GENERAL, EYE AND CHILDREN'S HOSPITAL. CHILDREN'S DEPARTMENT. Applications are invited for the post of RESIDENT MEDICAL OFFICER (House Officer grade) for the Children's Department (50 Beds), vacant early February. The appointment, which is recognised for candidates entering for the D.C.H., offers scope for wide experience in all Departments of Paediatrics, surgical cases, and attendance at Outpatient Departments at the General Hospital. Previous hospital experience in paediatrics is desirable. The appointment will be for a period of 6 months in the first instance.

Applications, together with copies of 3 testimonials, should be addressed to S. T. DAVIS, Group Secretary, General Hospital, Cheltenham.

CARSHALTON. QUEEN MARY'S HOSPITAL FOR CHILDREN. (840 Beds.) HOUSE PHYSICIAN (Senior House Officer). Care of acute medical, rheumatism, and poliomyelitis beds.

Applications, stating age, qualifications and experience, with copies of 3 testimonials, should reach the Secretary by 13th February, 1954.

CARDIFF. ST. DAVID'S HOSPITAL. (688 Beds.) CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (obstetrics) required in Maternity Department (118 Beds) commencing 9th March, 1954.

Apply in writing to Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

COVENTRY GROUP 20 HOSPITAL MANAGEMENT COMMITTEE invites applications for the following posts:—

Rugby. Hospitals of St. Cross and St. Luke's

SENIOR HOUSE OFFICER (resident) required 1st February, for General Medical Department (60 Beds and 2 outpatient clinics weekly).

SENIOR HOUSE OFFICER (resident) for General Surgical Department (60 Beds and outpatient clinic).

Rugby. Hospital of St. Cross (168 Beds)

SENIOR HOUSE OFFICER or HOUSE OFFICER (fracture and orthopædic). Recognised for F.R.C.S. and pre-registration.

Rugby. Hospital of St. Cross and St. Mary's Hospital

HOUSE SURGEON for Obstetric (40 Beds) and Gynæcological (12 Beds) Departments, required 10th March.

Nuneaton. Manor Hospital (139 Beds)

RECEIVING ROOM OFFICER required immediately. Salary scale £700–£1000 p.a.

SENIOR HOUSE OFFICER (traumatic and orthopædic) required. Salary £670. Vacant 6th March. Furnished flat available.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

CAERPHILLY DISTRICT HOSPITAL. (Married quarters available.) 2 SENIOR HOUSE OFFICERS (surgery) required at the above Hospital—6 miles from Cardiff (144 Beds for acute general surgery, orthopædics, E.N.T., ophthalmology and gynæcology; 26 Beds for general medicine, busy Outpatient, Casualty and Pathology Departments).

Apply, with full particulars, to the Group Secretary, Hospital Management Committee, St. Martin's-road, Caerphilly, near Cardiff.

COLCHESTER HOSPITAL MANAGEMENT COM-MITTEE. BLACK NOTLEY HOSPITAL, BRAINTREE AND ESSEX COUNTY HOSPITAL, COLCHESTER. Applications invited for post of HOUSE SURGEON. First, second, third or pre-registration post, tenable for 6 months from 14th February. Duties to include work in general surgical and gynæcological wards. Salary in accordance with the terms of service issued by the Ministry of Health, plus £50 p.a. Recognised under F.R.C.S. regulations.

Applications, with copies of 3 testimonials, should be forwarded to the Group Secretary, 14, Pope's-lane, Colchester, Essex.

COLCHESTER. ESSEX COUNTY HOSPITAL. Locum SENIOR REGISTRAR in Radiology required. Salary £22 a week.

Applications, with copies of 3 testimonials, should be sent to the Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

COTTINGHAM, near HULL. CASTLE HILL HOSPITAL. HOUSE SURGEON (Senior House Officer grade) for Major Thoracic Surgery Unit, to work under the supervision of the Consultant Thoracic Surgeon. Unit part of Group incorporating Mass Radiography Unit and full laboratory facilities.

Application forms from Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby E. Yorkshire.

COTTINGHAM, near HULL. RAYWELL SANATORIUM. (48 Beds.) SENIOR HOUSE OFFICER for above Sanatorium to work under the supervision of Consultant Chest Physician. Sanatoria part of Group with Major Thoracic Surgery and Mass Radiography Units and Laboratory facilities.

Application forms from Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, E. Yorkshire.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) House PHYSICIAN for period of 6 months in first instance from mid-February.

Application forms obtainable from GEORGE A. PAINES, Group Secretary, Hospital Management Committee, General Hospital, Croydon, to be returned immediately.

DARTFORD HOSPITAL MANAGEMENT COMMITTEE.

SENIOR HOUSE SURGEON (orthopædics and traumatic surgery) at The West Hill Hospital from early March, 1954.

SENIOR HOUSE SURGEON (E.N.T.) at The Southern Hospital from 2nd March, 1954.

*HOUSE OFFICER (general medicine) at The Southern Hospital.

*HOUSE SURGEON (general) at Joyce Green Hospital.

*Approved for pre-registration purposes.

Applications, stating age, qualifications, experience, nationality, and the names of 2 referees, for House Officers to the Medical Superintendent of the hospital concerned; and for Senior House Officers to the Group Secretary, The Bow Arrow Hospital, Dartford.

DOVER. ROYAL VICTORIA HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital. The post is recognised by the Royal College of Surgeons. Salary £350, £400, or £450 a year according to experience. A deduction of £100 a year will be made for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

DEWSBURY. THE GENERAL HOSPITAL. (119 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgery and casualty). Salary £670 p.a., less deduction for board, lodging, &c.

Applications, stating age, qualifications, details of present and previous appointments, together with the names of 2 referees, should be sent immediately to the Administrative Officer, The General Hospital, Dewsbury, Yorks.

DERBY. DERWENT HOSPITAL. (187 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (chest and infectious diseases) required. A Consultant Thoracic Surgeon attends this Hospital each week. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DUNDEE MENTAL HOSPITAL, Westgreen, Dundee. (Teaching Hospital for St. Andrews University.) Appointment of JUNIOR HOSPITAL MEDICAL OFFICER. Salary according to national scale. Suitable flat available for married man at appropriate rental. Facilities provided to comply with regulations for D.P.M. of R.M.P.A.

Applications, stating age, nationality, qualifications and experience, with recent testimonials, should be sent to the Physician-Superintendent.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP. BIRMINGHAM REGION. Applications invited from registered practitioners for following appointments:—

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

SENIOR HOUSE OFFICER (resident), surgical. Post vacant mid-January. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Corbett Hospital, Stourbridge (106 Beds)

SENIOR HOUSE OFFICER (resident), casualty. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

SENIOR HOUSE OFFICER (resident), surgical or HOUSE OFFICER (resident), surgical, pre-registration appointment. Post now vacant. Salary at appropriate rate, less deduction for residential emoluments.

Wordsley Hospital, near Stourbridge (478 Beds)

SENIOR HOUSE OFFICER (resident), Anæsthetist. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments. In addition to general surgery, experience is available in gynæcology and there is a major Orthopædic Unit. Regional Plastic Surgery Unit at this Hospital.

SENIOR HOUSE OFFICER (resident), surgical. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

SENIOR HOUSE OFFICER (resident), Physician. Post now vacant. Salary £670 p.a., less £150 p.a. in respect of residential emoluments.

Prestwood Sanatorium (200 Beds)

SENIOR HOUSE OFFICER (resident). Post now vacant. Salary £670 p.a., less £150 p.a. for residential emoluments.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

EDGWARE GENERAL (formerly Redhill County) HOS-PITAL, EDGWARE, MIDDLESEX. 2 RESIDENT HOUSE PHYSICIANS for above Hospital. Posts vacant 7th and 12th March, 1954. Salary £350–£450 p.a., according to experience. Deduction of £100 p.a. for board, lodging, &c. 6 months appointment.

Applications, stating age, qualifications, experience, and enclosing copies of up to 3 recent testimonials, to Medical Director of Hospital by 13th February, 1954. Candidates selected for interview will be notified by 20th February, 1954.

DARLINGTON MEMORIAL HOSPITAL. (210 Beds.) DARLINGTON DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON (resident), which post is recognised for the F.R.C.S. (Eng.). Salary in accordance with national scale.

Apply, giving age and references, to the undersigned forthwith. G. W. BECKWITH, Group Secretary.

EAST CUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. Appointment of House Officers. Applications are invited for the following appointments:—

Cumberland Infirmary, Carlisle (340 Beds)

*2 HOUSE OFFICERS (general surgery).

1 HOUSE OFFICER (gynæcology and obstetrics).

1 HOUSE OFFICER ("Specials"—E.N.T. and Eyes).

1 SENIOR HOUSE OFFICER (orthopædics).

*Pre-registration candidates are eligible to apply.

Applications, with names of 2 referees, should be forwarded immediately to the Secretary, East Cumberland Hospital Management Committee, Cumberland Infirmary, Carlisle.

EDINBURGH. CHALMERS HOSPITAL. Applications are invited for the appointment of NON-RESIDENT SENIOR HOUSE OFFICER in General Surgery (with some E.N.T.) from medical practitioners qualified at least 1 year. Appointment is for 1 year commencing 1st June, 1954, at National Health Service salary of £670 p.a.

Applications, with full particulars and names of 2 referees, should be forwarded to the Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9, within 1 month from appearance of this notice.

EDINBURGH. CHALMERS HOSPITAL. Applications are invited from registered medical practitioners for resident appointments as HOUSE SURGEON and HOUSE PHYSICIAN for 6 months commencing 1st April, 1954. National Health Service scale.

Applications, stating age, qualifications, and experience and names of 2 referees, to be sent immediately to Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9.

EXETER CITY HOSPITAL. (191 Beds.) Exeter and MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON for a Surgical Unit of 23 Beds at this Hospital. Married accommodation is available. National Health Service salary and conditions.

Applications, stating age, qualifications and experience with copies of 2 recent testimonials, to the Hospital Secretary, City Hospital, Exeter, within 14 days of the appearance of this advertisement.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. (320 Beds.) Applications are invited from registered medical practitioners (Male and Female), for the recently approved appointment of SENIOR HOUSE OFFICER (E.N.T. Department—31 Beds). The appointment is for a period of 12 months and is vacant now. Salary £670 p.a., with a deduction of £100 p.a. for residential emoluments. Early recognition of this post for the D.L.O. and F.R.C.S. examinations is expected.

Applications, with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary by 12th February, 1954.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. EXETER AND MID-DEVON HOSPITALS MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female), for the appointment of HOUSE SURGEON (Obstetric and Gynæcological Department), vacant 7th March, 1954. The appointment is for a period of 6 months.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary, by 6th February, 1954.

ENFIELD WAR MEMORIAL HOSPITAL, Chase-side, ENFIELD, MIDDLESEX. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER required for general medical and surgical duties in this acute General Hospital of 61 Beds. 12-month appointment. £135 p.a. deducted for board, lodging, and laundry.

Applications, stating age, nationality, qualifications and experience, with the names and addresses of 2 referees, to the Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, as soon as possible.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT HOUSE SURGEON (first post). Approved pre-registration post. Vacant 18th February 1954. General surgical duties. R practitioners within 3 months of qualification eligible. 6 months appointment.

Applications, stating age, qualifications, experience and nationality, with the names of 2 referees, to the Secretary of the Management Committee, immediately.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON at the above Hospital which is recognised for Pre-registration Service. Salary £350, £400, or £450 a year according to experience, less a deduction of £100 a year for residential emoluments. This post is recognised by the Royal College of Surgeons for the F.R.C.S. examination.

Applications, stating age, qualifications, experience, and the names and addresses of 2 referees, to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

FOLKESTONE. ROYAL VICTORIA HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE SURGEON at the above Hospital. Applicants should have held at least 3 hospital posts. The appointment will be tenable for a year. Salary £670 a year, less a deduction of £150 a year for residential emoluments.

Applications, stating age, qualifications, and the names and addresses of 2 referees, should be made to the Group Secretary, "Ash-Eton," Radnor Park West, Folkestone.

EPSOM, SURREY. ST. EBBA'S HOSPITAL. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR at above Hospital. The Hospital (865 Beds) is principally concerned with the treatment of voluntary cases of good prognosis and has over 1200 admissions annually. There are full facilities for psychological and physical investigations, and all modern treatment methods are used. The Hospital has Outpatient Departments and a Special Unit for Juvenile Psychiatric cases. Tutorials are given by senior staff in preparation for the D.P.M. and arrangements can be made to attend London neurological clinics. Full residential amenities are available. Candidates may visit the Hospital by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary, St. Ebba's and Belmont Group Hospital Management Committee, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms should be returned to him within 2 weeks of the appearance of this advertisement.

GLASGOW ROYAL INFIRMARY. Senior House Officers.

(*a*) Burns and Plastic Unit.

(*b*) Anæsthetics.

Duties at above Infirmary.

Write, giving 3 names for reference, not later than 4th February, 1954, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GLASGOW, N. FORESTHALL HOSPITAL. (640 hospital beds for long-term sick.) JUNIOR HOSPITAL MEDICAL OFFICERS (2 vacancies). Applicants must have been qualified for 2 years and have had experience as House Officers in general hospitals. The present establishment is for 5 Junior Hospital Medical Officers and they are encouraged to spend part of their time at a nearby teaching hospital to maintain their interest in general medicine. Facilities and supervision are also provided for medical officers wishing to pursue clinical research in preparation for higher degrees. Living-in optional.

Applications, with the names of 3 referees, should be sent to the Administrative Medical Officer, Foresthall, 657, Edgefauld-road, Glasgow, N.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. 2 HOUSE SURGEONS (Male or Female) required. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. Both are pre-registration posts. Salary £350, £400, or £450 according to experience, less £100 for residence. Alternatively, as Senior House Officer posts, salary £670, less £150 for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Hospital Secretary.

HALIFAX. ROYAL HALIFAX INFIRMARY. (301 Beds.) SENIOR HOUSE OFFICER in General Surgery required. Salary £670 p.a., with deduction of £130 p.a. for residence, &c.

Applications to Group Secretary, Royal Halifax Infirmary, Halifax.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (151 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) Applications are invited for the post of RESIDENT HOUSE OFFICER (surgical). Salary £350, £400, or £450 p.a., plus grant of £50 p.a., according to experience, less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HAVERFORDWEST. PEMBROKE COUNTY WAR MEMORIAL HOSPITAL. (151 Beds. Recognised for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE OFFICER (medical), which will become vacant on 19th February, 1954. Salary £350, £400, or £450 p.a., according to experience (plus special grant of £50 p.a.), less £100 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and nationality, with names and addresses of 3 referees, to Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) SENIOR HOUSE OFFICER (casualty and orthopædic). Post vacant now. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Resident, Male or Female. Post vacant now. National scale of salary.

Apply to Hospital Administrator.

HAROLD WOOD HOSPITAL, Harold Wood, Essex. (421 Beds.) Applications are invited for the whole-time post of REGISTRAR (anæsthetics) for an initial period of 6 months, at the main general and casualty hospital in the Group. Salary £775 p.a., less £130 p.a. board and lodging.

Apply, stating age, nationality, qualifications and experience, and names of 2 referees, to the Group Secretary, High Wood Hospital, Brentwood, Essex (Tel. Brentwood 2563), from whom full details may be obtained.

HEMEL HEMPSTEAD, HERTS. WEST HERTS HOSPITAL. Pre-registration HOUSE SURGEON. Post vacant 12th February, 1954.

Apply, quoting 2 referees, to the Hospital Secretary.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex. HOUSE PHYSICIAN (resident) required at above Hospital. Post recognised for M.D. (Lond.) Branch 1 and for pre-registration House Officers.

Apply, stating age, qualifications, nationality and experience, together with copies of not more than 3 recent testimonials, to Medical Director by 8th February.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (706 Beds.) SENIOR REGISTRAR (resident or non-resident) required in Department of Anæsthetics at above Hospital. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Field Heath-road, Hillingdon, Middlesex, by 15th February.

HEREFORD GENERAL HOSPITAL. (154 Beds.) House OFFICER (pædiatrics) required immediately.

Applications, with copies of 2 recent testimonials, to the Secretary, Hospital Management Committee, County Hospital, Hereford.

HITCHIN, HERTS. LISTER HOSPITAL. Applications are invited for the post of RESIDENT HOUSE SURGEON, vacant 1st March, 1954. (Recognised as pre-registration post.)

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, to be sent to the Medical Director, Lister Hospital, Hitchin, Herts.

HOUNSLOW GENERAL HOSPITAL. (81 Beds.) Applications are invited for the appointment of CASUALTY OFFICER (resident), Senior House Officer grade, post now vacant. Salary £670 p.a., less £140 for residence, &c.

Applications, stating age, qualifications, experience, with copies of 3 recent testimonials or names for reference, to Hospital Secretary, Hounslow Hospital, Staines-road, Hounslow, Middlesex.

HORNCHURCH. ST. GEORGE'S HOSPITAL. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident) at the above Hospital which accommodates 339 chronic sick patients. The post offers excellent geriatric experience. Salary £700–£50–£1000 p.a., less £150 p.a. for board and accommodation.

Applications, stating age, nationality, qualifications, present appointment and experience, with copies of 2 testimonials of recent date or names of referees, should be sent immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of JUNIOR HOUSE OFFICER (surgical) at this Hospital, which is approved by the licensing authority for Pre-registration Service. The Hospital is a busy one and is staffed by Consultants from Cambridge. There is also a full-time Senior Hospital Medical Officer on the staff.

Applications, giving full particulars, and names of 2 referees, to the Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket, Suffolk.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN, duties to commence on 1st March, 1954. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

HULL. KINGSTON GENERAL HOSPITAL. (447 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN (recognised pre-registration appointment). Salary £350, £400 or £450 according to experience. The post is resident and tenable for 6 months. Vacant 15th March, 1954.

Applications to be forwarded to the Secretary.

ILFORD. KING GEORGE HOSPITAL. There is a vacancy for a SENIOR HOUSE OFFICER ANÆSTHETIST at the above Hospital. The Officer appointed will be required to be available for duty in other hospitals in the Group. Salary will be at the rate of £670 p.a., less emoluments.

Applicants should have been registered not less than 1 year and should send applications, accompanied by copies of 3 testimonials, to the undersigned within 7 days of the appearance of this advertisement:

H. F. HARRIS, Deputy Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (360 Beds.) Applications are invited for the post of HOUSE SURGEON to the E.N.T. and Ophthalmic Departments. Post recognised for D.L.O. examination.

Applications, stating age, nationality experience and copies of recent testimonials, to the Hospital Secretary.

ISLEWORTH, MIDDLESEX. WEST MIDDLESEX HOSPITAL. HOUSE OFFICER required for Geriatric Unit. Resident, full-time.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, by 9th February, 1954.

KETTERING AND DISTRICT GENERAL HOSPITAL. (171 Beds.) Applications are invited for the post of HOUSE OFFICER (surgical). This post is approved for Pre-registration Service, and will be vacant from 3rd February, 1954.

Applications, with testimonials, to be sent to the Group Secretary, General Hospital, Kettering, as soon as possible.

KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. KETTERING GENERAL HOSPITAL. (171 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT SENIOR HOUSE OFFICER in Medicine, vacant 1st March, 1954. This post may be upgraded to Registrar during the current year. There are 6 House Officers and full Consultant staff.

Applications, stating age, nationality, qualifications and past experience and enclosing copies of 2 recent testimonials, should be forwarded as soon as possible to the Secretary, at Kettering General Hospital, Kettering, Northants.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (144 Beds.) HOUSE PHYSICIAN (either sex), first, second or third post, vacant 1st February, 1954. Approved pre-registration appointment. Tenable for 6 months. Practitioners registered before 1st January, 1953, may also apply.

Applications, with full particulars as to age, nationality, qualifications, &c., and copies of testimonials, to be sent to Group Secretary, St. John's Hospital, Keighley.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKSHIRE. (144 Beds.) 2 RESIDENT HOUSE SURGEONS (either sex) (general surgery, gynæcology, and E.N.T.); (general surgery, orthopædics, and E.N.T.). Both posts recognised under the F.R.C.S. regulations. First, second, or third posts, vacant now. Approved pre-registration appointments. Tenable for 6 months. Practitioners registered before 1st January, 1953, may also apply.

Applications, with full particulars as to age, nationality, qualifications, &c., and copies of testimonials, to be sent to Group Secretary, St. John's Hospital, Fell-lane, Keighley.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following REGISTRAR posts :—

General Medicine

Halifax Group (non-resident). Duties divided between general medical and geriatrics (110 general medical, 380 geriatric, beds).

General Surgery

(*a*) Dewsbury, Batley and Mirfield Group (135 general surgical beds) (resident Dewsbury General Hospital).

(*b*) Keighley and District Victoria Hospital (55 general surgical beds) (preferably resident).

(*c*) Clayton Hospital, Wakefield (75 general surgical beds). Duties are those of Resident Surgical Officer (recognised for F.R.C.S.).

(*d*) Hospitals in the York A Group (122 general surgical beds) (non-resident). If desired the duties may be altered to include a proportion of orthopædic surgery.

(*e*) Otley General Hospital (50 surgical beds) (resident). Consultant staff mainly from Leeds Teaching Hospitals. Appointment includes 2 sessions clinical work at the General Infirmary at Leeds.

Infectious Diseases

Castle Hill Hospital, Cottingham, E. Yorks (208 I.D. beds) (resident).

Orthopædic Surgery

(*a*) Huddersfield Royal Infirmary and other hospitals in the Huddersfield Group (34 orthopædic beds) (non-resident).

(*b*) The General Hospital, Batley (36 orthopædic beds), and other hospitals in the Dewsbury, Batley and Mirfield Group (resident).

(*c*) Hull A Group (50 orthopædic beds). Hull B Group and East Riding Group (50 orthopædic beds) (non-resident). Includes some duties in the Casualty Department at the Hull Royal Infirmary.

(*d*) Halifax Royal Infirmary (approximately 60 orthopædic beds) and at other hospitals in the Halifax Group (preferably resident).

Paediatrics

(*a*) Huddersfield and Halifax Groups (aggregate of 60 acute paediatric beds) with additional duties in infectious diseases (preferably resident). Small flat available at Northowram Infectious Diseases Hospital, Halifax.

(*b*) The Victoria Hospital for Sick Children, Hull (150 Beds), and other general hospitals with paediatric beds in the Hull A and the East Riding Hospital Management Committee Groups (non-resident).

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 5th February, 1954.

LEEDS REGIONAL HOSPITAL BOARD invites applications for the following SENIOR REGISTRAR posts :—

Psychiatry

(*a*) Duties at Meanwood Park Colony, Leeds, and as a Trainee Specialist in Child Psychiatry. Residential accommodation is available at Meanwood Park for a single person. The duties will be allocated to allow 5 sessions in the University of Leeds Department of Psychiatry (Children's Section) which is associated with the Leeds General Infirmary. Candidates must hold the D.P.M. or equivalent qualification.

(*b*) De la Pole Hospital, Willerby, Hull (1000 Beds). This Hospital has a high admission-rate and a separate Neurosis Unit for females. A self-contained flat will be available in the Hospital. It is anticipated that the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University of Leeds. Candidates must hold the D.P.M. or equivalent qualification.

Radiology

Duties at hospitals in the Halifax and Huddersfield Groups. Subject to satisfactory progress the successful candidate may be given an opportunity of undertaking a period of advanced training at the General Infirmary, Leeds.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, should be forwarded to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, not later than 19th February, 1954.

LEEDS (near). WOODLANDS (ORTHOPÆDIC) HOSPITAL, RAWDON. (92 Beds.) SENIOR HOUSE SURGEON required for Orthopædic Hospital at Rawdon. The post will be adjoined to the Casualty and Orthopædic Unit at the Royal Infirmary, Bradford, and offers excellent opportunities for a person interested in orthopædic work. Salary £670 p.a., less £130 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to Secretary, Bradford Royal Infirmary.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for post of RESIDENT or NON-RESIDENT REGISTRAR (Male or Female). Preference to candidates who have held house appointments at general hospitals. Unfurnished flat or house in Hospital grounds available for married applicants if required; furnished quarters for single persons. Modern methods of investigation and treatment carried out. Outpatients clinics (3) staffed from Hospital.

Applications, stating age, qualifications, and experience, and names of 2 referees, to be sent to the Medical Superintendent.

LANCASTER. BEAUMONT HOSPITAL. (124 Beds.) Applications are invited for the appointment of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER. Duties include the care of fever, tuberculosis, and medical paediatric cases under the supervision of the appropriate Consultants, and attendances at consultative clinics. The post will be vacant 1st February, 1954.

Applications, with full particulars and the names of 2 referees, to Group Secretary, Royal Lancaster Infirmary, Lancaster.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) SOUTH WARWICKSHIRE HOSPITAL GROUP (NO. 14). Applications are invited for the appointment of HOUSE PHYSICJAN. Post vacant on 14th February, 1954. Pre-registration post.

Applications, with 2 recent testimonials, should be sent to the Hospital Secretary, as soon as possible.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT. (266 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR (chest and infectious diseases) required. This Hospital has a complete Thoracic Surgical Unit including cardiac work; outpatient sessions for chest diseases and cardiology also held. Single accommodation is available. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LIVERPOOL, 14. BROADGREEN HOSPITAL. Applications are invited from registered medical practitioners for 2 vacancies as SENIOR HOUSE OFFICERS in the Regional Thoracic Surgical Unit. Salary will be £670 p.a., subject to a deduction of £130 p.a. for residential emoluments.

Application to be made on forms obtainable from the undersigned and returned completed within 10 days of this advertisement. H. BLYTHE, Group Secretary.

LINCOLN. BRACEBRIDGE HEATH HOSPITAL FOR MENTAL DISEASES. (1290 Beds.) Applications are invited for the appointment of a Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident), Male or Female (married or single). Salary £16 per week. There is residential accommodation available for a single or married officer. There will be scope for learning the use of modern psychiatric methods in the wards. Previous psychiatric experience is not essential. The appointment is subject to the provisions of the National Health Service superannuation regulations.

Applications, with names of 2 referees, should be forwarded as soon as possible to the Medical Superintendent, Bracebridge Heath Hospital, near Lincoln.

LINCOLN. BRACEBRIDGE HEATH HOSPITAL FOR MENTAL DISEASES. (1290 Beds.) Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident), Male or Female (married or single). Salary and terms of service as issued by the Ministry of Health. Commencing salary £700 p.a. rising to £1000 p.a. There is furnished accommodation available for a married Officer, or residential accommodation for a single person. There will be scope for work at outpatient clinics, and in the use of modern psychiatric methods in the wards. Previous psychiatric experience is not essential. The appointment is subject to the provisions of the National Health Service superannuation regulations.

Applications, with names of 3 referees, should be forwarded as soon as possible to the Medical Superintendent, Bracebridge Heath Hospital, near Lincoln.

LINCOLN. COUNTY HOSPITAL. (200 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required with some duties in the Orthopædic Department. Appointment for 1 year in the first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LLANELLY HOSPITAL, Llanelly, Carms. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, for work in the Surgical Unit.

Applications, stating age, qualifications and experience, should be forwarded to the Hospital Secretary, Llanelly Hospital, Llanelly, Carms.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for the post of REGISTRAR ANÆSTHETIST to the Saint Mary's Hospitals for a period of 12 months, vacant immediately. The person appointed will require to undertake duties in both the obstetrical and gynæcological sections of the hospitals, but his services are particularly required in connection with the obstetrical units, where the person appointed will be required to take a close and personal interest not only in the anæsthesia for operative obstetrics, but in the general measures to relieve the pain of childbirth. Salary in accordance with national scale.

Forms of application may be obtained from the undersigned. The closing date for applications is 8th February, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies, and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months from 1st April, 1954. National scale.

Application forms may be obtained from the undersigned and returned not later than 12th February, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for 2 posts of HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The posts are recognised for the purposes of the M.R.C.O.G. examination. The appointments are for 6 months commencing 1st April, 1954. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 12th February, 1954.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR REGISTRAR to a General Medical Unit, to commence as soon as possible, at the Manchester Royal Infirmary. Whole-time non-resident post, tenable for 12 months, renewable. Applicants must possess a higher qualification. Arrangements may eventually be made for the successful candidate to transfer to 1 of the Manchester Regional Hospitals to continue training.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 10th February, 1954.

F. J. CABLE, Secretary to the Board of Governors.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. ANÆSTHETICS HOUSE OFFICER, to commence on 1st May, 1954. The appointment is for 6 months at a salary of £400 or £450 p.a., with a deduction at the rate of £100 p.a. in respect of board and lodging and other services provided. Applicants should have had experience in the specialty.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 17th February, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL INFIRMARY, MANCHESTER, 13. SENIOR RESIDENT ANÆSTHETIST, to commence on 1st May, 1954. The appointment is for 12 months at a salary of £670 p.a., with a deduction at the rate of £130 p.a. for residence. Applicants should have had experience in the specialty.

Applications to be made on forms obtainable from the undersigned and to be returned not later than 17th February, 1954.

G. H. TAYLOR, Secretary.

MANCHESTER ROYAL EYE HOSPITAL. United MANCHESTER HOSPITALS. Applications are invited for SENIOR HOUSE OFFICER post. Salary £670 p.a., less £130 p.a. for residential emoluments.

Application forms may be obtained from H. R. NORTH, General Superintendent.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE.

Park Hospital, Davyhulme (General Hospital—426 Beds)

1 SENIOR HOUSE OFFICER (anæsthetics). Hospital recognised for training for Diploma in Anæsthetics. Post now vacant.

1 HOUSE OFFICER (E.N.T.) (pre-registration). Post now vacant.

Eccles and Patricroft Hospital (General Hospital—72 Beds)

1 HOUSE OFFICER (post-registration post). Additional allowance of £50 p.a. Post now vacant. The work of the Hospital is mainly surgical and there is a busy Outpatient Department.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Thoracic Surgery to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool.

Applications, together with copies of 2 recent testimonials, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Chest Diseases in the Ashton, Hyde and Glossop Group and Oldham and District Group of hospitals. The post offers experience in both outpatient clinics and pulmonary hospitals.

Application forms are obtainable from and returnable to the Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, Astley-road, Stalybridge, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. NON-RESIDENT REGISTRAR in E.N.T. Surgery required with main duties at Hope Hospital and the Royal Manchester Children's Hospital.

Applications, with copies of 2 recent testimonials, should be sent to the Group Secretary, at Salford Royal Hospital, Salford, 3, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of NON-RESIDENT REGISTRAR in E.N.T. Surgery to the Salford and West Manchester Groups of hospitals, with main duties at Salford Royal Hospital and Park Hospital, Davyhulme.

Applications, together with copies of 2 recent testimonials, should be forwarded to the Group Secretary at Salford Royal Hospital, Salford, 3, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR in Chest Diseases, the main duties to be with the Bury and Rossendale Hospital Management Committee, with duties at Chest Clinics and at Aitken Sanatorium and Peel Hall Pulmonary Hospital, and other hospitals in the area.

Apply, giving names of 2 referees, to—

H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in the Board's Non-tuberculous Thoracic Surgery Unit of 48 Beds at Park Hospital, Davyhulme. 1-year appointment, renewable. Post now vacant.

Application forms from Secretary, West Manchester Hospital Management Committee, Park Hospital, Davyhulme, Urmston.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of Whole-time RESIDENT SURGICAL REGISTRAR to the West Manchester Hospital Management Committee. Primarily for duty at Park Hospital, Davyhulme, but with duties at other Group hospitals. Post now vacant. 12 months appointment, subject to renewal.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER, 4. ANCOATS HOSPITAL. (General Hospital, 152 Beds.) NORTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration appointment of HOUSE OFFICER (surgery) with some E.N.T. surgery, now vacant.

Applications, stating age, nationality, details of qualifications with dates, and names and addresses of 2 referees, to be sent to the undersigned within 10 days of the appearance of this advertisement.

A. T. SAMPSON, Group Secretary.

Crumpsall Hospital, Manchester, 8.

MANCHESTER. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. WITHINGTON HOSPITAL, MANCHESTER, 20. Applications are invited for the post of SENIOR HOUSE OFFICER (E.N.T. surgery) to the above Group, with principal duties at, and based upon, Wythenshawe Hospital.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded to the undersigned as soon as possible.

A. H. KEATES, Group Secretary.

Withington Hospital, Manchester, 20.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) to commence as soon as possible. This appointment, in a busy general Hospital staffed by Manchester Consultants, affords excellent experience to suitably qualified candidates. Opportunity will be given to assist in the major surgical work of the Hospital. Post recognised under F.R.C.S. regulations. Applications will also be considered for the post of Junior House Officer (surgical).

Full particulars should be forwarded to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER, 9. BOOTH HALL CHILDREN'S HOSPITAL. Applications are invited for the following posts :—

HOUSE SURGEON. Recognised pre-registration post. Post vacant now.

RESIDENT SENIOR HOUSE OFFICER (surgical). Post vacant now. Main duties will be in recently opened Burns Unit, but person appointed will take part in general surgical rota.

RESIDENT SENIOR HOUSE OFFICER (surgical). Post vacant now.

National scale and conditions.

Apply, stating age, nationality, and usual relevant particulars to the Medical Superintendent as soon as possible, and enclose copies of 2 recent references.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant now. Salary at the rate of £350, £400, or £450 according to experience. A deduction at the rate of £100 a year is made in respect of board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (135 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RECEIVING-ROOM OFFICER. Post vacant February, 1954. Salary £670 a year, with deduction of £150 a year for residential emoluments.

Applications to Administrative Officer at Hospital as soon as possible.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the appointment of SENIOR HOUSE OFFICER. Salary £670 p.a., national scale and conditions. The Sanatorium contains 330 Beds for the treatment of tuberculosis and includes a Major Thoracic Surgical Unit.

Applications, stating age, qualifications, and names of 2 referees, to be sent not later than 28th February, 1954, to—

A. A. HOWICK,

Secretary to the Management Committee.

NEWCASTLE REGIONAL HOSPITAL BOARD. TeesSIDE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR PATHOLOGIST (whole-time) required, for Area Group Laboratory. Appointment, to commence 1st March, 1954, will be for 1 year in the first instance and may be renewed for a further period. Appointment offers unique opportunity to obtain training in all branches of clinical pathology. Salary £775–£890 p.a.

Applications, together with names and addresses of referees (preferably), or testimonials, to a total of 3, to be sent to the Senior Administrative Medical Officer, "Blythswood South," Osborne-road, Newcastle upon Tyne, 2, within 14 days.

MARKET DRAYTON (near), SALOP. CHESHIRE JOINT SANATORIUM. (305 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer or Senior House Officer, according to experience). Post offers exceptional experience in the treatment of pulmonary tuberculosis.

Applications to the Medical Superintendent at the Sanatorium.

NEWCASTLE GENERAL HOSPITAL. (861 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. The resident post of SENIOR HOUSE OFFICER (Casualty Department) becomes vacant on 1st February, 1954, and is tenable for 12 months.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials, as soon as possible.

NEWCASTLE GENERAL HOSPITAL. (861 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (Neurosurgical Department). The above post, either resident or non-resident, becomes vacant on 1st March, 1954. The appointment is tenable for 12 months in the first instance.

Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials by 22nd February, 1954.

NOTTINGHAM CHILDREN'S AND CITY HOSPITALS. (880 Beds. Recognised training hospitals for the D.C.H.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (paediatrics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM CITY HOSPITAL. (804 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, vacant 1st March, 1954. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (804 Beds.) Applications are invited for the post of HOUSE SURGEON, vacant 1st March, 1954. Recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be sent immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR ORTHOPÆDIC AND FRACTURE HOUSE OFFICER. The post offers exceptional experience in traumatic and orthopædic surgery. Duties to commence as soon as possible. Salary and conditions of service in accordance with Ministry regulations. If resident £150 deducted for emoluments.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Secretary.

NOTTINGHAM GENERAL HOSPITAL. Ear, Nose AND THROAT DEPARTMENT. Applications are invited for the post of SENIOR E.N.T. HOUSE OFFICER at the above Hospital. This appointment is recognised for the D.L.O. and the F.R.C.S. examinations. Terms and conditions of service in accordance with the regulations of the Ministry of Health. Duties to commence about the end of January. Although the post is normally resident, consideration will be given to any applicant who desires to live out.

Applications, stating age, qualifications, and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Required, SENIOR SURGICAL HOUSE OFFICER for the above Hospital. Duties to commence as soon as possible. If resident £150 deducted for emoluments. Salary and conditions of service in accordance with the published conditions of the Ministry of Health.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to—

HENRY M. STANLEY, Group Secretary.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for the post of HOUSE SURGEON to the Radiotherapy and E.N.T. Departments. This post is recognised as a pre-registration appointment.

Applications, accompanied by 2 testimonials, should be forwarded to the Resident Medical Officer, Mount Vernon Hospital, Northwood, Middlesex, by 6th February, 1954.

NEWTON ABBOT HOSPITAL. (General Section—65 Beds.) RESIDENT SENIOR HOUSE SURGEON (Male or Female) required immediately. Married quarters available.

Applications, stating qualifications, nationality, age, with copy testimonials, to be sent to the Group Secretary, Torquay District Hospital Management Committee, 62/64, East-street, Newton Abbot, S. Devon.

ORPINGTON HOSPITAL, Orpington, Kent. Applications are invited for the following posts :—

RESIDENT SENIOR HOUSE OFFICER (Male) in the Geriatric Department (285 Beds) plus 30-Bedded Annexe at Chislehurst. The post offers excellent opportunities for studying for postgraduate degrees and for study in the acute section of the Hospital. Vacancy is from 1st March, 1954. Interview by appointment welcomed.

CASUALTY OFFICER (Male) at Senior House Officer grade to commence on or about 15th February, 1954. Resident preferred but not essential. The post is recognised for the F.R.C.S.

Applications with testimonials to Physician-Superintendent.

NEWPORT, MON. ROYAL GWENT HOSPITAL. (260 Beds—9 Residents.) JUNIOR HOSPITAL MEDICAL OFFICER (E.N.T. and ophthalmic) required. Post recognised for D.L.O. There are 23 E.N.T. and 8 ophthalmic beds. Salary £700–£50–£1000, less £120 for board-residence.

Write, quoting 2 referees, to T. A. JONES.
64, Cardiff-road, Newport, Mon.

NORTHALLERTON HOSPITAL MANAGEMENT COM-MITTEE. FRIARAGE AND MATERNITY HOSPITALS. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in Obstetrics and Gynæcology for the above Hospitals. Previous experience in obstetrics is essential. The post which will be vacant 1st March, 1954, will be tenable for 6 months, and is subject to the terms and conditions of service for hospital medical staff.

Applications, with copies of testimonials or the names of 2 referees, should be addressed to the Secretary, Northallerton Hospital Management Committee, at the Friarage Hospital.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. DEPARTMENT OF OBSTETRICS AND GYNÆCOLOGY. PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP. Applications invited from duly qualified and registered medical practitioners for the appointment of RESIDENT OBSTETRICAL OFFICER (Senior House Officer grade), vacant 1st April, 1954. There will be additional duties at the Flete Maternity Home and the Alexandra Maternity Home, which are parts of the Department. Candidates should have had considerable experience in a department of obstetrics and gynæcology. The appointment will be for a period of 12 months and is renewable. Salary £670 p.a. Terms and conditions of service are in accordance with the National Health Service terms. The post is recognised by the Royal College of Obstetricians and Gynæcologists for the Membership examination of the College.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, should be sent to ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Applications are invited from registered medical practitioners for the appointments of :—

(1) HOUSE OFFICER in Obstetrics, Alexandra Maternity Home, Devonport, vacant 1st March, 1954.

(2) RESIDENT ANÆSTHETIST, Greenbank Road Hospital vacant immediately. Recognised for the D.A.

(3) HOUSE SURGEONS (2 posts), Greenbank Road Hospital, vacancies immediately, and 13th March, 1954. Recognised for the Fellowship of the Royal College of Surgeons.

Applications, stating age, nationality, qualifications, and experience, with the names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.

7, Nelson-gardens, Stoke, Plymouth.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Saint Mary's Hospital

SENIOR HOUSE PHYSICIAN, vacant 23rd February, 1954. The duties will be mainly in medical wards that form an Admission Unit for 450 geriatric beds in the Group, a Consultant Physician being in charge of this Unit. In addition, the successful candidate will act as Registrar to 20 acute medical beds in the Hospital.

HOUSE PHYSICIAN, vacant 8th March, 1954. Pre-registration post.

(107 surgical beds) Recognised for F.R.C.S.

SENIOR HOUSE OFFICER (Casualty and Orthopædic Departments), vacant now.

HOUSE SURGEONS, vacant now and 2nd February, 1954. Pre-registration posts.

Royal Portsmouth Hospital

SENIOR HOUSE SURGEON (Orthopædic and Casualty Departments), vacant 15th February, 1954.

Queen Alexandra Hospital

(124 surgical beds) Recognised for F.R.C.S.

HOUSE SURGEONS, vacant now. Pre-registration posts.

Applications, stating age, experience, and qualifications, and names of 2 referees, should be submitted as soon as possible to—

35, Grove-road South, Southsea. E. H. HURST.

PORTSMOUTH. ST. JAMES' HOSPITAL FOR MENTAL AND NERVOUS DISEASE. (1097 Beds.) GROUP 49 HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGION. JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital is approved as a psychiatric teaching hospital and the post offers excellent experience in the treatment of the neuroses, the psychoneuroses, the maladjusted child, and the problems of delinquency. The Neurological Department of the Hospital is also recognised by the examining bodies and arrangements are made to enable junior medical staff to fulfil the D.P.M. regulations regarding mental deficiency. Intending candidates may visit the Hospital by appointment.

Applications, giving age, experience, qualifications, and the names and addresses of 2 referees, should be sent to the Physician-Superintendent within 14 days of the appearance of this advertisement.

PERTH. COUNTY AND CITY OF PERTH GENERAL HOSPITALS. The following post will fall vacant on 1st February, 1954. HOUSE SURGEON (general surgical wards), Perth Royal Infirmary. This post is recognised for Pre-registration Hospital Service and by Royal College of Surgeons under regulations for the F.R.C.S.

Applications should be sent to the Medical Superintendent, Perth Royal Infirmary, Perth.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required 15th February, 1954.

Applications to the Hospital Secretary.

PETERBOROUGH. MEMORIAL HOSPITAL. Peterborough and Stamford Hospital Management Committee. Applications are invited for the position of HOUSE PHYSICIAN which will become vacant on 1st March, 1954. The appointment will be for 6 months.

Applications, with testimonials, should be addressed to the Secretary, The Memorial Hospital, Midland-road, Peterborough.

READING. ROYAL BERKSHIRE (403 Beds) and BATTLE (343 Beds) hospitals. Applications are invited for the posts of 2 RESIDENT HOUSE SURGEONS, Area Accident and Orthopædic Department, vacant 1st March, 1954. Also casualty duties. F.R.C.S. recognised.

Apply stating age, nationality, qualifications with dates, present post, with copy of recent testimonial, to Secretary, Royal Berkshire Hospital.

READING. ROYAL BERKSHIRE HOSPITAL. (403 Beds.) Applications invited for joint appointment of JUNIOR HOUSE OFFICER to the Paediatric and E.N.T. Departments, for period of 6 months, vacant 1st March, 1954. Salary within scale £350–£450 p.a., less £100 for board, residence, &c.

Applications should state age, qualifications with dates, nationality and particulars of present post, accompanied by 1 copy recent testimonial, to Secretary.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, vacant from 24th February, 1954, and tenable for 6 months. This Hospital provides for acute medical and surgical patients in addition to a limited number of fever cases. The post, which is also open to pre-registration candidates, offers good opportunities for gaining experience in both general medicine and fevers.

Applications, stating age, nationality, qualifications with dates, present appointment and experience, together with copies of 2 recent testimonials or names of referees, should be sent immediately to the Medical Superintendent.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (2) are required in February, 1954, in the General Surgical Unit at the above Hospital. Recognised for F.R.C.S. 6 months appointments. This very active general surgical unit of approximately 100 Beds affords ample opportunity for candidate to obtain first-class tuition and experience.

Applications, stating age, nationality, qualifications with dates, and details of experience, together with copies of 2 recent testimonials or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER in the Department of Ophthalmology, vacant from 24th February, 1954.

Applications, stating age, qualifications, present appointment and experience with dates, together with copies of 2 testimonials of recent date or names of 2 referees, should be sent immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SALISBURY GENERAL HOSPITAL. Salisbury Group hospital management committee. Applications are invited for the post of RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SALFORD ROYAL HOSPITAL. Salford Hospital Management committee. Applications are invited for the following pre-registration (surgical) posts :—

HOUSE SURGEON (E.N.T. and Neurosurgical Department).
HOUSE SURGEON (Casualty Department).

Appointments for 6 months, now vacant.

Applications, with copies of 3 testimonials, should be addressed to the Secretary, Salford Royal Hospital, Salford, 3.

SALFORD ROYAL HOSPITAL. Salford Hospital Management committee. Applications are invited for the appointment of SENIOR HOUSE OFFICER (Orthopædic and Casualty Departments), resident. Post vacant now. Recognised for F.R.C.S. and gives opportunities for experience in emergency surgery. Salary subject to a deduction of £155 p.a. for board and lodging.

Applications, with copies of 3 testimonials, should be sent to the Secretary, Salford Royal Hospital, Salford, 3.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSpital board. Applications are invited for the post of REGISTRAR in Medicine, for duty in the Gastro-Intestinal Unit, Western General Hospital, Edinburgh. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSpital board. Applications are invited for the post of REGISTRAR in Tuberculosis with the Edinburgh Royal Victoria and Associated Hospitals. The duties will mainly lie in the chief Chest Clinic for Edinburgh, though the successful candidate will be associated with the care of some 40 adult and 20 children's tuberculosis beds. The post is associated with the Department of Tuberculosis and Diseases of the Respiratory System, University of Edinburgh, and may involve teaching and research. The post is superannuable and the conditions of service are in accordance with the regulations.

Applications, giving particulars of age, qualifications, and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, within 30 days.

SCOTLAND. WESTERN REGIONAL HOSPITAL board. Applications are invited for the appointment of REGISTRAR in Infectious Diseases based at Ruchill Hospital, Glasgow, which will be for 1 year in the first instance. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 2nd March, 1954.

SCOTLAND. WEST FIFE HOSPITALS BOARD OF management. Applications are invited from medical practitioners, either qualified or undertaking Pre-registration Service, for 2 HOUSE SURGEON posts at the Dunfermline and West Fife Hospital, Reid-street, Dunfermline (General Surgical —115 Beds), and 2 HOUSE PHYSICIAN posts at the Northern Hospital, Leys Park-road, Dunfermline (General Medical —102 Beds). Resident. Salary £350–£400 p.a. and Whitley Council conditions of service.

Applications, giving full particulars and stating when available, should be made to the Medical Superintendents of the respective Hospitals immediately.

SCUNTHORPE AND DISTRICT WAR MEMORIAL hospital. (269 Beds. Recognised for training for F.R.C.S.) sheffield regional hospital board. Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SCUNTHORPE, LINCS. WAR MEMORIAL HOSPITAL. (267 Beds.) scunthorpe hospital management committee. Vacancy for HOUSE PHYSICIAN (Senior House Officer) about mid-March in busy department offering excellent clinical experience.

Applications, naming 2 referees, to Group Secretary.

SHEFFIELD. CITY GENERAL HOSPITAL. (642 Beds.) sheffield regional hospital board. 2 Whole-time RESIDENT or NON-RFSIDENT CASUALTY REGISTRARS required. The successful candidates to reside at the Hospital when on duty (including "on call" duty). Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 8th February, 1954, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Wholetime Resident Locum CASUALTY REGISTRAR required at the City General Hospital, Sheffield, from 21st February, 1954. Remuneration at the rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Wholetime Resident Locum REGISTRAR (anæsthetics) required at Beckett Hospital, Barnsley, from 13th February. Remuneration at rate of £16 per week with a deduction for residence.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, naming 2 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts :—

(*a*) NON-RESIDENT REGISTRAR or SENIOR HOUSE OFFICER in General Medicine, at the Royal Infirmary, Sheffield. Grade according to qualifications and experience. Post vacant 1st April, 1954.

(*b*) MEDICAL REGISTRAR (normally resident), Children's Hospital, Sheffield. Inpatient and outpatient responsibilities. Full opportunities to attend clinical conferences in this and associated hospitals.

Applications for both posts, should state age, qualifications and experience, with the names of 3 referees, and be sent to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, not later than 5th February, 1954.

SHEFFIELD. KING EDWARD VII ORTHOPÆDIC hospital. Locum MEDICAL OFFICER required (Male or Female), resident or non-resident. The post would suit applicant interested in children's diseases and would afford time for study. Salary £13 per week, less deduction if residential emoluments are provided.

Applications, stating age, qualifications, together with names of 2 referees, to Group Secretary, Sheffield No. 3 Hospital Management Committee Lodge Moor Hospital, Sheffield, 10.

SOUTHPORT AND DISTRICT HOSPITAL MANAGEment committee.

Southport General Infirmary
SENIOR HOUSE OFFICER (Surgeon with casualty duties).
Southport Promenade Hospital
SENIOR HOUSE OFFICER (Surgeon, duties include mainly orthopædic and E.N.T. work).

Above resident posts are tenable for 12 months and will be vacant in February. Salary £670 p.a., less £130 for board, &c.

Apply, with 2 testimonials, to—
T. CROOK, Group Secretary,
Southport and District Hospital Management Committee.
Promenade Hospital, Southport.

SWINDON HOSPITAL GROUP. (536 Beds.) Applications are invited for the appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade) at Great Western Hospital, Swindon. Post recognised by R.C.S. for 6 months of years training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Wingfield-Morris Orthopædic Hospital, Oxford, includes large number of industrial injuries. Residential emoluments £120 p.a.

Full details, giving names of 2 referees, to Secretary, 7, Okus-road, Swindon, as soon as possible.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITAL GROUP. (536 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON for General Surgical Unit (80 Beds). Post recognised for F.R.C.S. and training under pre-registration internship regulations. Married accommodation available.

Applications, giving full details and names of not more than 3 referees, to Secretary, Swindon and District Hospital Management Committee, 7, Okus-road, Swindon, as soon as possible.

SIDCUP, KENT. QUEEN MARY'S HOSPITAL. Applications are invited for the post of RESIDENT CASUALTY OFFICER (Senior House Officer) to commence 1st March, 1954. Duties—mainly surgical casualties and minor operations, with fracture work under general supervision of Orthopædic Surgeons.

Applications, stating age, qualifications and experience, with copies of recent testimonials, to the Secretary, Sidcup and Swanley Hospital Management Committee.

SLOUGH, BUCKS. UPTON HOSPITAL. Applications are invited from general practitioners for HONORARY CLINICAL ASSISTANT appointments in the specialties of plastic surgery, general medicine, gynæcology and obstetrics, and ophthalmology. Candidates are required to be members of a Medical Protection Society.

Applications to Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 13th February.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for the L.O.M.S.) RESIDENT SENIOR HOUSE OFFICER required immediately. Salary £670 p.a.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) and SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required towards end of January. Post recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing Hearing Aid Centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) CASUALTY OFFICER SENIOR HOUSE OFFICER (orthopædic) required for the above Hospital (Orthopædic Unit 74 Beds). This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions.

Applications, with copies of testimonials, to be submitted as soon as possible, to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) ORTHOPÆDIC HOUSE SURGEON required. Post recognised for Pre-registration Service and tenable for 6 months. This Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are also drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

ST. ALBANS. SHENLEY HOSPITAL. (2053 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time PSYCHIATRIC REGISTRAR required for 1 year in first instance. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Shenley Hospital Management Committee, Shenley Hospital, near St. Albans, Herts, by 8th February, 1954.

ST. ALBANS CITY HOSPITAL. (382 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR (non-resident) required for 1 of 2 Acute General Medical teams at above Hospital. Post suitable M.R.C.P. training. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, Herts, by 12th February, 1954.

ST. ALBANS CITY HOSPITAL. (382 Beds.) Mid-Herts GROUP HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required for duties mainly at above Hospital for gynæcological and obstetric work. Hospital recognised for D.Obst.R.C.O.G.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, Herts, by 5th February, 1954.

ST. ALBANS CITY HOSPITAL, St. Albans, Herts. (382 Beds.) CASUALTY OFFICER (Registrar grade) required for the Casualty Department at the above Hospital. Post recognised for the F.R.C.S. regulations and vacant now for 6 months or longer. This is a temporary appointment.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans, immediately.

ST. ALBANS CITY HOSPITAL, St. Albans, Herts. (382 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 general surgical teams. (Recognised for the F.R.C.S.) Post vacant approximately 19th February, 1954, and tenable for 6 months. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications, stating age, qualifications and experience, together with the names of 2 referees, to the Group Secretary, St. Albans City Hospital, Normandy-road, St. Albans.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the posts of 2 SENIOR HOUSE OFFICERS (anæsthetics). 1 post will be held at Stockport Infirmary, and the other at Stepping Hill Hospital, Stockport, and they may be either resident or non-resident. Both posts are recognised for the D.A. and F.F.A. R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

STOCKPORT. STEPPING HILL HOSPITAL. (464 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Assistant Resident Surgical Officer). The post is recognised for the F.R.C.S.

Applications, stating age, experience, and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport, Cheshire, immediately.

STAFFORD HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), Male or Female. Recognised for D.A. Post now vacant. Duties mainly at General Infirmary, Stafford (175 Beds), which is the main and acute general hospital of the Group.

Applications, with copies of 3 testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds.) STAFFORD HOSPITAL MANAGEMENT COMMITTEE. RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer status) required. Male or Female.

Applications, giving particulars of age, previous experience and copies of 2 recent testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICERS (medical) required. 2 posts vacant very shortly. Pre-registration posts.

Applications, with full details, to the Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (938 Beds.) Applications invited for HOUSE OFFICER (general surgery), 3 posts vacant shortly. Hospital recognised for F.R.C.S. Posts recognised for experience during pre-registration period.

Apply, with copy testimonials stating age, nationality and full details of previous service, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for SENIOR HOUSE OFFICER (orthopædics). Post recognised for F.R.C.S.

Apply, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for HOUSE OFFICER (general surgery) vacant shortly. Hospital recognised for F.R.C.S. examinations, and the post is recognised for experience during the pre-registration period.

Apply, with copy testimonials, stating age, nationality and full details of previous service, to the Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (orthopædics) required, vacant now. Post recognised for F.R.C.S.

Applications, stating age and nationality, together with details of previous service, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

ST. HELENS. ECCLESTON HALL HOSPITAL. (75 Beds.) ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Hospital. The person appointed will work under the supervision of the Consultant Chest Physician for the Group. There are 75 Beds and the work comprises all types of tuberculosis. Good residential accommodation for a single person, male or female, is available.

Applications to be forwarded to N. RICHARDS, Secretary, Group Office, Whiston Hospital, Prescot.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. The following Resident House Officer posts become vacant on the dates shown :—

St. Helens Hospital

1 HOUSE SURGEON, immediate vacancy.
1 HOUSE PHYSICIAN, vacant 1st March, 1954.
1 HOUSE SURGEON, vacant 1st April, 1954.

Whiston Hospital

HOUSE PHYSICIAN, vacant 1st March, 1954.

All the above posts are recognised for Pre-registration Service.

Applications, stating age, experience, and date of qualification, and giving 2 names for reference, should be forwarded to the Secretary, Group Office, Whiston Hospital, Prescot, immediately.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, should be addressed to—

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANSEA. MOUNT PLEASANT HOSPITAL. Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics for the new Maternity Unit of 44 Beds which will be opened shortly at the above Hospital.

Applications, stating age, qualifications and experience, should be addressed to the Group Secretary, Glantawe Hospital Management Committee, St. Helen's-road, Swansea.

SWANSEA HOSPITAL. (403 Beds.) Glantawe Hospital MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of ANÆSTHETIST (Senior House Officer grade) at Swansea Hospital. The Hospital is recognised under D.A. regulations.

Applications, stating age, qualifications, and experience, should be addressed to—

O. C. HOWELLS, Group Secretary,
Glantawe Hospital Management Committee.
St. Helen's-road, Swansea.

SWANSEA. MORRISTON HOSPITAL. (500 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Surgical Department.

Applications, stating age, qualifications and experience, should be addressed to the Medical Superintendent, Morriston Hospital, Swansea. O. C. HOWELLS, Group Secretary.

SWANSEA. MORRISTON HOSPITAL. (500 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of SENIOR HOUSE OFFICER in the Neurological and Neurosurgical Department.

Applications, stating age, qualifications and experience, should be addressed to the Medical Superintendent, Morriston Hospital, Swansea. O. C. HOWELLS, Group Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. REGISTRAR required to the Special Unit for Research in Juvenile Rheumatism at the above Hospital. Post offers scope for those interested in research, pædiatrics, rheumatology or cardiology. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 6th February.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE OFFICER (medical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

TUNSTALL. BURSLEM, HAYWOOD AND TUNSTALL WAR MEMORIAL HOSPITAL. (96 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for SENIOR HOUSE OFFICER (surgical).

Apply, with copy testimonials and details of previous appointments held, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, as soon as possible.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY, Hawkey's-lane, NORTH SHIELDS, NORTHUMBERLAND. (109 Beds.) Appointment of SENIOR HOUSE PHYSICIAN.

Applications from registered medical practitioners who have been qualified at least 1 year should be sent, with 2 testimonials or names of 2 referees, to the House Governor.

VENTNOR, ISLE OF WIGHT. ROYAL NATIONAL HOSPITAL FOR DISEASES OF THE CHEST. (249 Beds.) SENIOR HOUSE OFFICER (resident) unmarried. Hospital has all facilities for major thoracic surgery.

Applications, with names of 2 referees, to Physician-Superintendent.

WALTHAM ABBEY, ESSEX. HONEY LANE HOSPITAL. Applications are invited for the newly established post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. Successful candidate will be responsible, under visiting Consultants, for day-to-day care of tuberculous (56 Beds) and infectious disease patients (34 Beds), and will be required to undertake relief duty, when necessary, on the general medical ward. Candidates must have had experience in the treatment of tuberculosis and infectious diseases. The salary for the post is in accordance with national scale, viz.: £700–£50–£1000 p.a., from which a deduction of £130 p.a., for board, lodging, &c., will be made. Alternatively, it may be possible to provide married accommodation at an agreed rental for a suitable candidate. The Hospital, of modern construction, is situated in pleasant surroundings adjacent to Epping Forest, within easy reach of London.

Applications, with details of experience and names and addresses of 2 referees, to reach Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex (from whom further information can be obtained), by 5th February, 1954.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON (Male or Female) required. Post vacant 1st March. National salary. Successful candidate will be resident at the Old Windsor Unit of the Hospital. Applicants are required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and experience, together with copies of recent testimonials or names of 3 referees, to Hospital Secretary by 6th February.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (311 Beds.) HOUSE PHYSICIAN to the Pædiatric Department, vacant 18th March. Preference will be given to applicants wishing to specialise in pædiatrics. The Department is recognised for the D.C.H.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (311 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post, vacant immediately.

Applications, with copies of 2 testimonials, to the Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (311 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under area orthopædic team. Appointment for 6 months in first instance. Vacant middle February.

Applications, with copies of 2 testimonials, to the Secretary.

WARRINGTON GENERAL HOSPITAL. (368 Beds.) Applications are invited for the post of HOUSE SURGEON (Male or Female; recognised for pre-registration) at the above Hospital. National Health Service terms and conditions. The staffing of the Surgical Unit consists of a Senior Registrar, Registrar and 2 House Surgeons. The post offers a comprehensive training in surgery.

Apply, giving full particulars, to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment, now vacant, of HOUSE PHYSICIAN (non pre-registration). The appointment is for 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications, and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WESTON-SUPER-MARE GENERAL HOSPITAL. (110 Beds.) Applications are invited from registered medical practitioners for the resident appointment of HOUSE SURGEON (non pre-registration). The appointment will be for a period of 6 months in the first instance and may be renewed for a further 6 months.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the West Wales Hospital Management Committee. The successful candidate will be based at the Pembroke County War Memorial Hospital, Haverfordwest. The post may be either resident or non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of a REGISTRAR in General Surgery to serve the Newport and East Monmouthshire Hospital Management Committee. The successful candidate will be based at the Royal Gwent Hospital, Newport, and may also be expected to serve other hospitals within the Group. The post is non-resident and will be subject to review at the end of the first year.

Forms of application should be obtained from the Senior Administrative Medical Officer, Welsh Regional Hospital Board, Cathays Park, Cardiff, within 14 days of appearance of this advertisement.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Psychiatry required for duties at hospitals in the above Group. The person appointed will be required to assist the Consultant Psychiatrist at consultative clinics and with inpatient treatment, &c. The main centre is at Billinge Hospital where there is an active psychiatric unit with all modern treatments. Over 300 admissions annually. Good training facilities are available for anyone desiring to specialise in psychiatry, and to take the D.P.M. courses. Resident or non-resident post.

Applications, stating age, qualifications, and particulars of previous hospital appointments, together with the names of 2 referees, should be received by the undersigned as soon as possible.

Knowsley House, Wigan. T. W. HURST, Secretary.

WORTHING GROUP HOSPITAL MANAGEMENT COM-MITTEE.

Worthing Hospital, Lyndhurst-road, Worthing, Sussex

Applications are invited from registered medical practitioners for the appointment of SURGICAL HOUSE OFFICER (Senior House Officer grade). The post is recognised for the revised Fellowship regulations in respect of the 6 months training required by candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality and experience, together with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

Worthing Hospital (221 Beds—General)

1 HOUSE SURGEON vacancy.

Applications from either registered medical practitioners, or pre-registration candidates, stating age, qualifications, experience, nationality, and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

A. V. OAKTON, Group Secretary.

WATFORD AND DISTRICT PEACE MEMORIAL HOS-PITAL, WATFORD, HERTS. (198 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE SURGEON, recognised for pre-registration. Post vacant in March. Salary according to National Health Service scale.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, should be sent to—

CYRIL HOPKINSON, Administrator.

WICKFORD (near), ESSEX. RUNWELL HOSPITAL. (1032 Beds.) SENIOR HOUSE OFFICER (Male or Female) required for 1 of the Consultant's Divisions and to assist in outpatient work. Excellent postgraduate facilities for D.P.M. Salary £670; residential charge £180.

Applications, with copies of testimonials, to the Secretary.

WORCESTER ROYAL INFIRMARY. (243 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICER in Surgery which is now vacant. This appointment is the senior of the resident surgical posts and offers wide experience in surgery. The post is tenable for 1 year and is subject to the terms and conditions of service for hospital medical staff. A charge of £130 p.a. will be made for residential emoluments.

Applications, with copies of 3 recent testimonials, should be sent to the Secretary, from whom further particulars may be obtained.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION.

The Royal Hospital, Wolverhampton (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant 1st February.

HOUSE OFFICER (Ear, Throat and Nose Department), vacant now.

Women's Hospital, Wolverhampton

HOUSE OFFICERS (2), gynæcological and obstetric, 1 vacant mid-February, 1 vacant mid-March. Appointments recognised for M.R.C.O.G.

New Cross Hospital, Wolverhampton

HOUSE OFFICER (general surgery), vacant now.

Wolverhampton and Midland Counties Eye Infirmary

HOUSE OFFICER, vacant now. Appointment recognised for F.R.C.S. and D.O. examinations.

Applications, with copies of 3 recent testimonials, to be sent to W. COCKBURN, Group Secretary.

The Royal Hospital, Wolverhampton.

WOLVERHAMPTON HOSPITAL MANAGEMENT COMMITTEE GROUP NO. 16 BIRMINGHAM REGION. THE ROYAL HOSPITAL, WOLVERHAMPTON. (An Associated Hospital of the University of Birmingham Medical School.) Applications are invited for the appointment of a JUNIOR HOSPITAL MEDICAL OFFICER in Pathology at The Royal Hospital, Wolverhampton. Salary £700–£50 (6)–£1000 p.a. Resident or non-resident. Post vacant 1st February.

Applications, naming 3 referees, should be addressed to—

W. COCKBURN, Secretary.

The Royal Hospital, Wolverhampton.

WREXHAM. MAELOR GENERAL HOSPITAL. (513 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of HOUSE SURGEON at the above Hospital to commence immediately. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.). Salary will be at the rate of £350, £400 or £450 p.a., according to experience, less £100 p.a. for full residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to—

WILLIAM JONES, Secretary, Wrexham,
Powys and Mawddach Hospital Management Committee.
Maelor General Hospital, Croesnewydd-road, Wrexham.

YORK. COUNTY HOSPITAL. CITY HOSPITAL AND MILITARY HOSPITAL (CIVILIAN WING). (General Hospitals of 269, 265, and 60 Beds respectively with full Consultant staff.) SENIOR HOUSE OFFICER in Anæsthetics, resident or non-resident, as soon as possible. Post recognised for D.A., application made for recognition for F.F.A.R.C.S. Salary £670, residence available at a charge of £153. Previous experience in anæsthetics desirable but not essential.

Applications, giving age, nationality, experience, qualifications and names of 2 referees, immediately to the Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

YORKSHIRE. EAST RIDING HOSPITAL MANAGE-MENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (218 Beds)

(*a*) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer), vacant now. Recognised for F.R.C.S.

(*b*) HOUSE SURGEON (first, second, or third post), vacant now. Pre-registration post. Recognised for F.R.C.S. General surgical duties, some orthopædics.

Broadgate (Mental) Hospital, Beverley, Yorks (650 Beds)

(*c*) HOUSE PHYSICIAN (first, second, or third post), vacant now.

Salary for (*a*) is £670 p.a., less £140 board, lodging; for (*b*) and (*c*) £350–£450, less £100 board, lodging. Fully qualified practitioners also invited to apply for pre-registration post.

Detailed applications to Secretary, Westwood Hospital, Beverley, Yorks.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 700-Bed University-teaching, General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically oriented psychotherapy with children and adults, shock therapies and neurologic training. Salary range $1620–$2220 annually, plus laundry, uniforms, and room.

Address inquiries to Medical Director.

NEW YORK. VASSAR BROTHERS HOSPITAL. 1-year ROTATING INTERNSHIPS. We solicit inquiry relative to several vacancies on an active rotating intern service with excellent teaching facilities. Intern salary offered is $150 per month plus full maintenance.

ELLISON H. CAPERS, Administrator.
Vassar Brothers Hospital, Poughkeepsie, N.Y.

NEW YORK. NEW ROCHELLE HOSPITAL, New ROCHELLE, NEW YORK, U.S.A. (360-Bed general community hospital.) Approved by American College of Surgeons and American Medical Association for Interneship and Residency Training. Only graduates from approved university schools accepted. Term of Interneship: 1st July, 1954–30th June, 1955. INTERNES—$100 per month plus full maintenance. Return passage to England paid by Hospital after completion of interneship.

Apply Superintendent

ST. JOHN'S NEWFOUNDLAND. GENERAL HOS-PITAL. (475 Beds.) NEWFOUNDLAND PROVINCIAL DEPARTMENT OF HEALTH. INTERNES. Applications are invited from registered and provisionally registered medical practitioners for the above posts. Salary $2500 p.a., less $480 for maintenance, &c. Transportation to St. John's will be paid by the Department of Health and on completion of 12 months service, return fare to the United Kingdom. The Hospital is recognised by the Royal Colleges of Canada and is fully accredited by the Joint Commission of the United States of America and Canada on hospital accreditation.

Applications, with full details as to age, &c., should be sent as soon as possible to Dr. E. WILSON, Superintendent.

General Hospital, St. John's, Newfoundland.

CHANNEL ISLANDS, JERSEY. GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER at the above Hospital. Previous experience is essential. The Hospital has 200 Beds and is recognised as a training hospital for the F.R.C.S. Post is vacant on 1st April, 1954. The appointment is for 6 months in the first instance, but is renewable for a further 6 months. Salary £700 p.a., less £100 for residential emoluments.

Applications to be submitted not later than 20th February, 1954, to the President, Public Health Committee, General Hospital, Jersey, C.I.

Public Appointments

DURHAM. COUNTY COUNCIL OF DURHAM. Health DEPARTMENT. Applications are invited from registered medical practitioners (Female) for the post of ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER at a commencing salary of £950 p.a., rising by annual increments of £50 to £1300 p.a. Travelling expenses will be paid in accordance with a scale approved by the Whitley Council. Canvassing directly or indirectly will disqualify.

The appointment is subject to certain conditions, particulars of which may be obtained from the County Medical Officer of Health, Shire Hall, Durham, to whom applications, together with the names of not more than 3 referees, should be returned not later than 20th February, 1954.

J. K. HOPE, Clerk of the County Council.

Shire Hall, Durham, 20th January, 1954.

DERBYSHIRE COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MATERNITY AND CHILD WELFARE MEDICAL OFFICER AND SCHOOL MEDICAL OFFICER. Applications are invited from registered medical practitioners for this whole-time superannuable post. Salary £950 p.a. by annual increments of £50–£1300 p.a., plus a car allowance.

Application forms are obtainable from Dr. J. B. S. MORGAN, County Medical Officer, County Offices, St. Mary's Gate, Derby, to whom they should be returned by 17th February.

HER MAJESTY'S COLONIAL SERVICE. Leprosy SERVICE IN NIGERIA. MEDICAL OFFICER required for the administration of preventive medical services and the clinical work of curative medicine in relation to leprosy. The selected officer would not deal with leprosy only but would also have the general medical and surgical care of leprosy patients. He would be stationed at a settlement with properly equipped hospital (with Nursing Sister) and laboratory. The work also includes the supervision of leprosy segregation villages and treatment centres within a radius of 100 miles; making epidemiological investigations; and teaching African staff. Clinical research work is encouraged. The officer will normally have professional colleagues and live in a European community. Appointments may be made as follows:—

(*a*) on 3 years probation for permanent and pensionable employment in the Colonial Medical Service, with retiring age of between 45 and 55. Pensions are at the rate of 1/600th of final pensionable emoluments for each completed month of reckonable service.

(*b*) from the National Health Service. Candidates may resign from the National Health Service but retain their superannuation rights during their time in Nigeria (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Colonial salary on leaving Nigeria at the end of their engagements; or

(*c*) on short-term contract with inclusive salary of from £1087 p.a. rising to £2000 p.a.; on completion of contract a gratuity is paid at the rate of £37 10s. for each completed period of 3 months service (including leave).

Officers appointed under (*a*) or (*c*) are required to contribute to a Widows' and Orphans' Pension Scheme. Salaries for officers appointed under (*a*) or (*b*) range from £950–£1850 p.a. Starting salary in all cases depends on experience and war service. Quarters are provided at low rents. Free passages for Officer and his wife and assisted passages for up to 2 children under the age of 16. An outfit allowance is payable on first appointment. Income-tax at local rates. Normal tour of service is 18 months. Generous home leave. Candidates must hold medical qualifications registrable in the United Kingdom.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/14/010).

HER MAJESTY'S COLONIAL SERVICE. Barbados. A MEDICAL OFFICER is required at the General Hospital, Barbados. Duties are general and those ordinarily performed in a large acute general hospital of 336 Beds, including medicine, surgery, obstetrics, theatre and ward work, anaesthetics, casualty, outpatients and other departmental duties as the Governor may from time-to-time direct. Candidates must possess qualifications registrable in the United Kingdom; experience desirable but not essential. Appointment can be made on permanent basis with pension (non-contributory) at the age of 55; or on agreement for 3 years in the first instance (in which event passage arrangements quoted below are slightly different). For officers on agreement arrangements will, if possible, be made to continue any superannuation payments which they may be making. Salary scale is $3600–$4800 (£750–£1000) a year, starting salary depending upon candidate's age and experience. In addition, a temporary cost-of-living allowance of £32 10s. a year is payable. Furnished quarters are available at rental of 5% of salary (for officers on agreement, furnished quarters are provided free). Free passages on appointment are provided for Officer and family up to maximum cost of £300. Free passages on leave are provided for Officer and wife only at end of tour of service of 3½ years (pro rata payment on completion of not less than 2 years of tour). Home leave may be granted on full pay after each tour. Income-tax at local rates. Social and recreational amenities are good. Climate is healthy for Europeans. Educational facilities are available.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/28/02).

HER MAJESTY'S COLONIAL RESEARCH SERVICE. WEST AFRICAN MALARIA RESEARCH UNIT. Applications are invited for the following posts:—

(1) SENIOR RESEARCH OFFICER (Malariologist) to be in charge of Unit carrying out investigations of the epidemiology of malaria in the Savannah zones of West Africa (at Kaduna Northern Nigeria in the first instance). Candidates should preferably possess a medical qualification registrable in the United Kingdom; otherwise at least second-class honours degree of a recognised Commonwealth University, or equivalent. They must have had special training in malariology and experience of the investigation of the disease in the field.

(2) RESEARCH OFFICER (Malariologist) to assist (1). Candidates should preferably possess a medical qualification registrable in the United Kingdom; otherwise at least second-class honours degree of a recognised Commonwealth University, or equivalent, with at least 2 years approved postgraduate experience.

(3) ENTOMOLOGIST mainly to study systematics and ecology of the anopheline fauna of West Africa in the Savannah zones of which very little information is at present available. The post offers unique opportunity for original research. Candidates should possess at least a second-class honours degree of a Commonwealth University or equivalent degree with at least 2 years approved research experience after graduation. Previous experience of malaria entomology is desirable or, at least, special knowledge of the Diptera and preferably of the Culicidae.

Salary according to age and qualifications in the following scales:—For vacancy (1) Senior Medical Research Officer, Grade II—£1320–£1520 a year plus overseas research allowance of £460–£490 a year. For candidates without medical qualifications:—Principal Scientific Officer £1000–£1375 a year plus United Kingdom pay addition of £75–£84 a year, plus overseas research allowance of £420–£300 a year. For vacancy (2) Medical Research Officer £565–£1270 a year plus overseas research allowance of £390–£460 a year. For candidates without medical qualifications:—Scientific or Senior Scientific Officer £400–£950 a year plus United Kingdom pay addition of £40–£72 a year, plus overseas research allowance of £250–£420 a year. For vacancy (3) Scientific or Senior Scientific Officer with salary, United Kingdom pay addition and Overseas Research allowance as for Vacancy (2).

Married quarters are available at a rental of 10% of basic salary. Free passages are provided on appointment and on leave for Officer, wife, and children under 13 years of age. An outfit allowance of £60 is payable on first appointment. Superannuation is provided under the Colonial superannuation scheme.

Application forms are obtainable from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/11/03).

HER MAJESTY'S COLONIAL RESEARCH SERVICE. A MEDICAL RESEARCH OFFICER is required for the Virus Research Unit in Nigeria. Duties include research (in the laboratory and in the field) on arthropods of medical importance with particular reference to viral and rickettsial diseases. Candidates must possess a medical qualification registrable in the United Kingdom and have had experience of virus research. Some preliminary training at the Virus Department of the National Institute for Medical Research, Mill Hill, could be given.

Salary according to age and experience in the following scales:—

(*a*) Medical Research Officer: Grade III £565, £600–£50–£750 plus overseas research allowance—£390 on salaries below £600; £410 on salaries £600–£700; £420 on salaries of £750. Grade II £800–£50–£1050 plus overseas research allowance £420. Grade I £1070–£50–£1270 plus overseas research allowance £420 on salaries £1070–£1170; £460 on salaries £1220–£1270.

If Government quarters are provided a rent of not more than 10% of basic salary would be charged. Outfit allowance £60. Free passages provided for Officer, wife, and children up to 13 years. Superannuation provided under Colonial Superannuation Scheme.

Forms of application obtainable from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1, quoting reference No. 27215 366, and further information regarding nature of duties from Director of Colonial Medical Research at the same address.

HER MAJESTY'S COLONIAL SERVICE. Northern RHODESIA. MEDICAL OFFICERS required for general medical work in European and African Hospitals in Northern Rhodesia. Appointments may be on a permanent basis with pension (non-contributory) on retirement at the age of 55, or on short-term contract with gratuity on satisfactory completion of engagement. A doctor in the National Health Service may resign from the National Health Service but retain his superannuation rights (up to a limit of 6 years) during his time in Northern Rhodesia and receive a resettlement grant of 20% of the aggregate of his Northern Rhodesia salary on leaving Northern Rhodesia at the end of his engagement. Salary scale ranges from £870 to £1695 p.a. Starting-point in the scale is determined according to age, experience and qualifications. A temporary (non-pensionable) cost-of-living allowance of from £114 to £195 10s. a year is payable. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. The gratuity for contract service is payable on completion of the contract at the rate of £100–£150 p.a. Free passages are provided in both directions for Officer and wife, and assisted passages for children. Annual local leave is permissible and generous home leave is granted after each tour of 3 years. Quarters when available are provided at rental of 10% of salary. Income-tax at local rates. Educational facilities are available. Candidates (male only) should be between 25 and 35 years of age. They should possess medical qualifications registrable in the United Kingdom and have had at least 12 months postgraduate experience.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/3/01).

HER MAJESTY'S COLONIAL SERVICE. Jamaica. MEDICAL OFFICER OF HEALTH (Male or Female) required for general medical and public health duties in Jamaica. Appointment will be on 3 years probation for permanent and pensionable employment. Salary scale ranges from £1200 p.a. to £1500 p.a. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Normal retiring age is 60. Quarters are not provided. Free passages on appointment are provided for Officer, wife, and children under 18 years, not exceeding 5 persons in all, and on leave for Officer, wife and up to 2 children only. Income-tax at local rates. Local leave is permissible and home leave on full pay is granted after each tour of 2 years duration. Climate is healthy for Europeans. Educational facilities are available. Candidates must possess qualifications registrable in the United Kingdom, and have obtained a Diploma in Public Health.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE.117/32/02).

HER MAJESTY'S COLONIAL SERVICE. Trinidad. Medical Officers possessing qualifications registrable in the United Kingdom are required for the following posts in Trinidad:—

(*a*) MEDICAL SUPERINTENDENT for the Leprosarium on the Island of Chacachacare and for leprosy control work on the mainland. Candidates should have had postgraduate experience in Leprosy control work.

(*b*) SURGEON to undertake full-time duties at the Caura Sanatorium. Candidates should possess F.R.C.S. or higher degree in surgery and have had considerable experience in thoracic surgery.

Appointments can be made on a permanent basis with pension (non-contributory) at the age of 55, or on short-term agreement. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights during their time abroad (up to 6 years) and receive a resettlement grant of 20% of the aggregate of their Trinidad salary on leaving Trinidad at the end of their engagement. Salary scale ranges from $(B.W.I.)5760–$(B.W.I.)6240 (£1200–£1300) p.a. (1 B.W.I. $ = 4s. 2d.). Officers may engage in consulting or specialist practice in their own specialty, elsewhere than in a Government Medical Institution. Pension is earned at the rate of 1/600th of the final pensionable emoluments for each completed month of service. Income-tax at local rates. Free passages are provided for Officer, wife and children, not exceeding 5 persons in all on first appointment and up to 3 adult fares on leave. Tour of service is 3 years. Local leave is permissible and generous home leave is granted after each tour.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings Great Smith-street, London, S.W.1 (quoting reference No. 27215/26/52).

GLASGOW. CORPORATION OF GLASGOW. Assistant MEDICAL OFFICER (Mental Services). Applications are invited from registered medical practitioners for appointment in the Health and Welfare Department for duties relating to mental defectives and certification of mental patients. Salary scale £950–£50–£1300 p.a. Post is superannuable, subject to medical examination.

Applications, stating age, qualifications, and experience, and names of 3 referees, should be lodged with me (envelope marked "Appointment—Assistant Medical Officer, Mental Services") by 13th February, 1954.

WILLIAM KERR, Town Clerk.

City Chambers, Glasgow, C.2.

LANCASHIRE COUNTY COUNCIL. Registered medical practitioners required for appointment of ASSISTANT DIVISIONAL MEDICAL OFFICERS in areas adjacent to Bolton/Bury, Manchester, and Wigan. Possession of D.P.H. desirable. Salary £950–£50–£1300 p.a. Travelling and subsistence allowances where applicable. Posts superannuable and subject to medical examination.

Application forms and further particulars obtainable from County Medical Officer, East Cliff County Offices, Preston.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 8, St. James's-square, London, S.W.1.

District	County	Latest date for receipt of applications
MELKSHAM	.. WILTSHIRE	.. 13TH FEBRUARY, 1954
RAUNDS	.. NORTHAMPTON	.. 13TH FEBRUARY, 1954

GOVERNMENT OF ETHIOPIA. Princess Tsahai HOSPITAL, ADDIS ABABA. Vacancy for PHYSICIAN. Duties involve treating 50 to 150 outpatients per day, and all medical cases in the hospital, which has 84 Beds. Private practice is not permissible. Salary £2140 p.a., tax free for initial 3-year contract. Free (part-furnished) accommodation. Return passage including wife and children.

Applicants should send full particulars of their qualifications and experience, together with the names of 2 referees, to the Secretary, Ministry of Health, (Division 5a), Savile-row, London, W.1. Closing date for receipt of applications is 13th February, 1954.

GOLD COAST MEDICAL SERVICE. The following vacancies exist in the Medical Department of the Gold Coast :—

MEDICAL OFFICERS for general duties, including hospital and district work.

RADIOLOGIST to take charge of Hospital X-ray Department and to train junior staff as X-ray attendants. Candidates must possess the Diploma in Medical Radiology (Diagnostic) or equivalent qualification.

Appointments are to the Gold Coast Civil Service on short-term contracts of 2 tours of 18–24 months in the first instance with gratuity on satisfactory completion of service. Basic salary scale would be £1330–£2310 a year. Gratuity would be at the rate of £37 10s. for each completed 3 months of service. Candidates in the National Health Service may resign from the National Health Service but retain their superannuation rights while in the Gold Coast (for not more than 6 years). Salary, in this case, would be in the scale £1055–£1850 a year, and officers would receive a resettlement grant of 20% of the aggregate of their Gold Coast salary at the end of their engagements. Starting-point in both salary scales is determined according to qualifications and experience. Quarters are provided at rental not exceeding £150 p.a. Income-tax at local rates. Free passages provided for Officer, wife, and up to 3 children under 13 years of age. Annual local leave is permissible and generous home leave is granted after each tour.

Application forms can be obtained from the Director of Recruitment (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. CDE. 117 13/04).

LEEDS. CITY OF LEEDS. Public Health Department. Applications are invited from qualified and registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER for Maternity and Child Welfare. Applicants should have had postgraduate experience, preferably including obstetrics, ante-natal work and paediatrics. The salary scale is £950–£1300 p.a., with annual increments of £50. The person appointed will be required to pass a medical examination and to contribute to the Superannuation Fund.

Application forms and particulars of the duties may be obtained from the undersigned at the Public Health Department, 25, East-parade, Leeds, 1, and completed applications should be returned by 10 A.M. on Monday, 15th February, 1954. Canvassing in any form, either directly or indirectly, will be a disqualification. I. G. DAVIES, Medical Officer of Health.

NORTHUMBERLAND. COUNTY OF NORTHUMBERLAND. National Health Service Act, 1946. Joint appointment of AREA EXECUTIVE MEDICAL OFFICER for the West Area and MEDICAL OFFICER OF HEALTH for the Urban District of Hexham and the Rural Districts of Bellingham, Haltwhistle and Hexham. Applications are invited from registered medical practitioners for the joint appointment of Area Executive Medical Officer for the West Area and Medical Officer of Health for the Urban District of Hexham and the Rural Districts of Bellingham, Haltwhistle and Hexham. The salary for the joint appointment will be £1487 10s. rising by 3 annual increments of £56 5s. and 1 of £62 10s. to £1718 15s., plus a travelling allowance in respect of a motor-car not exceeding 12 h.p. The person appointed will be required to give his, or her, whole time to the duties of the joint appointment and must not engage directly or indirectly in private practice. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, to the National Conditions of Service and to 3 months notice in writing on either side, and the successful candidate will be required to pass a medical examination.

Application forms and further particulars may be obtained from the Clerk of the County Council, County Hall, Newcastle upon Tyne, 1, to whom applications must be submitted not later than 6th February, 1954.

THURSDAY ISLAND. Qualified medical practitioners are invited to apply for position of TUBERCULOSIS OFFICER, Thursday Island. Appointee will be in charge of tuberculous patients in Public Hospital and 45-Bed Native Sanatorium at Thursday Island and will also survey Torres Strait Islands and Gulf of Carpentaria Mission Stations in Queensland, including B.C.G. vaccinations and X-ray surveys. Appointee must be prepared to travel by air and in small boats. Salary range—£1725–£1975 plus £16 extra cost-of-living allowance and £75 district allowance p.a. and free board, lodging and laundry, or allowance in lieu. Commencing salary within range will depend on qualifications and previous experience of appointee.

Applications, stating age, qualifications, experience, testimonials and date when able to commence duties, close with Under Secretary, Department of Health and Home Affairs, Brisbane, Queensland, from whom further particulars may be obtained, on 31st March, 1954.

MANCHESTER. CITY OF MANCHESTER EDUCATION COMMITTEE. Applications are invited for the post of MEDICAL OFFICER (School Health). Preference given to candidates with special experience in diseases of children and retinoscopy, and holding D.P.H. or D.C.H. Salary £950–£1300. Previous experience in a similar appointment with another Local Authority may be taken into account in determining initial salary.

Application form and particulars obtainable (stamped addressed foolscap envelope) from Chief Education Officer, Education Offices, Deansgate, Manchester, 3, to be returned to Town Clerk, Town Hall, Manchester, 3, by 20th February. Envelope to be endorsed "Medical Officer (School Health)."

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

Reynolds Jamaica Mines, Ltd., require a Resident Medical Officer with qualifications registrable in United Kingdom for their clinic in Jamaica, B.W.I. Work mainly general practice among administrative staff, industrial workers and their families (total numbering approximately 600). Officer will have sole charge of the clinic which has X-ray and laboratory facilities. Appointment to begin March, 1954, with salary by arrangement not less than £1300 per year. Furnished house provided at small monthly rental. First-class passages paid from United Kingdom for employee and his family.—Further details and application form will be sent on receipt of preliminary application, stating qualifications and experience and including photograph, addressed to: Resident Manager, Reynolds Jamaica Mines, Ltd., Lydford P.O., St. Ann, Jamaica, B.W.I.

Medical Officer required for whaling station at South Georgia leaving mid-February returning May, 1955. Age preferably over 30, some surgical experience essential. Salary £100 per month all found. Applications, giving details of age, qualifications and experience, with copies of 3 recent testimonials and names of 3 referees, to be sent forthwith to: CHR. SALVESEN & Co., 29, Bernard-street, Leith.

Assam. British Medical Officer required for old-established group of Tea Estates. Age preferably 30–40 years. Tropical clinical and hygiene experience an advantage. 3-year agreement. Gross income, including dearness allowance, the equivalent in Rupees of approximately £2100 rising to £2300 p.a. Bungalow with basic furniture, lighting, heating, and servants free; car provided.—Applications, with 3 names for reference purposes, to Address, No. 893, THE LANCET Office, 7, Adam-street, Adelphi London, W.C.2.

Imperial Chemical Industries Limited, Metals Division, urgently requires an Assistant Works Medical Officer, under 30, in the Birmingham area. The appointment is a temporary one, of about 12 months duration, and may therefore be more attractive to applicants anxious to obtain, or add to, their industrial medical experience. Salary would be in the region of £1000 a year.—Application forms may be obtained from Assistant Staff Manager, I.C.I. Metals Division, Kynoch Works, Witton, Birmingham, 6.

Lady, 26, medical family, seeks position as Receptionist to doctor or dentist. Willing household duties, drive car.—Address, No. 892, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Doctor's Secretary (London Hospital), seeks post with accommodation, London area. Highest recommendations.—Address, No. 895, THE LANCET Office, 7, Adam-street, Adelphi London, W.C.2.

Portland-place, W.1. 2 handsome ground-floor consulting-rooms—doctors or dentists. Door attendance and waiting-room. £400 p.a. each.—No Agents. LANgham 4956.

A first-class, select Old People's Home (also Registered Nursing Home) lovely Western City. Excellent audited accounts showing approximately 14% net. Owner retiring.—Sole Agents, STOCKTON & PLUMSTEAD, Mawnan, Falmouth. Ref.: 8060.

Harley-street (just off). Private garage for 2 cars to let.—Apply PEPPER, ANGLISS & YARWOOD, 28, St. George-street, W.1. MAYfair 7592.

Lady requires regular home typing (about 8 hours weekly). Accurate and reliable.—Address, No. 894, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE, LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

"Pregnancy Diagnosis by the Xenopus Method." 24-hour service.—Send specimen of urine and £1 1s. fee to: WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (Telephone: MUSeum 5386–7).

Austin A30, A40, and A70 range—new Ford Popular and all Show Models. Limited number of orders now acceptable from proven essential users.—Application form, brochures, easy terms, from: H. A. SAUNDERS LTD., 140/144, Golders Green-road, London, N.W.11.

Contemplation of a cruise or seagoing holiday can be more sharply focused by a message to Stelp & Leighton Ltd., 9 13, Fenchurch-buildings, London, E.C.3. Telephone: ROYal 3111, telling them how long you wish to be away. They will send you appropriate details and as Agents for all Lines will give you every assistance in concluding arrangements for the voyage of your choice.

Name Plates in Oxydised Bronze with Ceramic Enamel letters. Leaflet and Sketch post free.—G. MAILE & SON LTD., 367, Euston-road, N.W.1 (Phone: EUSton 2938).

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